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Vol. XVIII, No. 7 JULY, 1929

JOURNAL
OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

TRADE MARK

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THE 77th ANNUAL MEETING WILL BE HELD AT RAPID CITY (BLACK HILLS), SOUTH DAKOTA, DURING WEEK OF AUGUST 26, 1929.

F. W. Brown, Lead, So. Dak., Local Secretary

The 1929 Meetings of the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, Conferences of Pharmaceutical Association Secretaries will also be held at Rapid City, same time and place.

For Association Roster and Roster of the Boards of Pharmacy, of Officers of Pharmaceutical Associations, Local Branches, see pages x, xii, xiv, etc.

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THE SEVENTY-SEVENTH

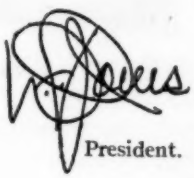
ALLOW me to impress upon you the advantageous central location of the meeting place of the AMERICAN PHARMACEUTICAL ASSOCIATION for 1929.

Rapid City is geographically located just slightly to the west of the half-way point between the two oceans, and approximately the width of Nebraska to the north of the nation's central latitude.

While for years it was somewhat isolated, now railways converge at this point to radiate in all directions. Fine roadways lead to the Black Hills from all points of the compass. "The Hills" are endowed with a most delightful climate, and form a wonderland of scenic beauty. They are said to comprise the richest hundred square miles in natural resources on the face of the earth. No mineral is known to science that is not found there, and some of the keenest chemists and mineralogists have for many years found interesting employment in this area.

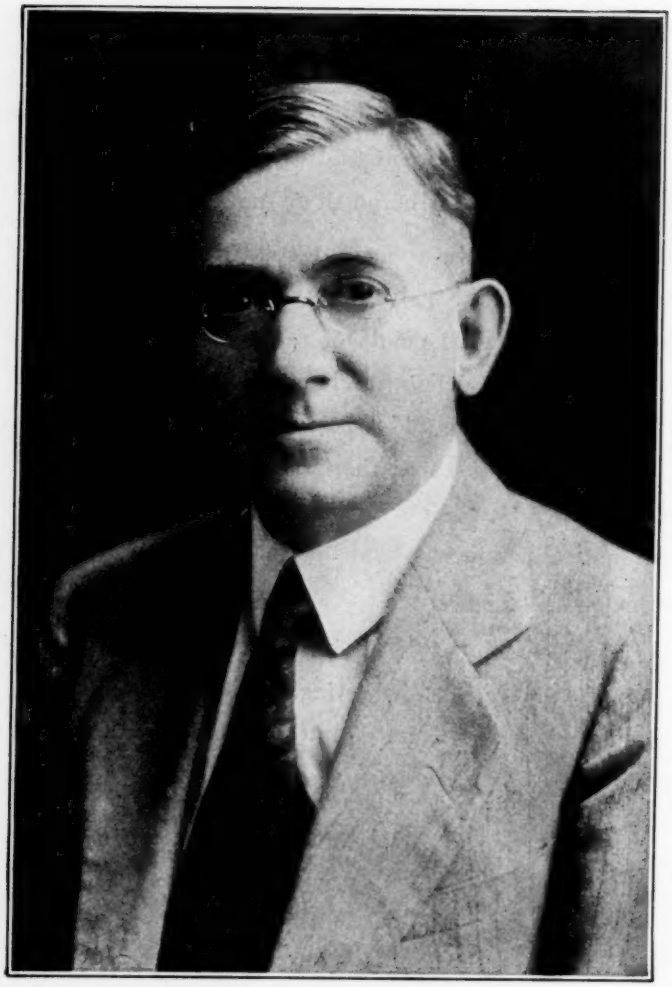
There is no member of the ASSOCIATION who will not be enriched by attendance at this meeting. An excellent program, which will include several speakers of international reputation, has been arranged.

The Great Northwest welcomes you.



President.

Watertown, S. D., July 1929.



DENNY BRANN, PRESIDENT, N. A. R. D.

JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

VOL. XVIII JULY, 1929 No. 7

DENNY BRANN.

The subject of this brief sketch is a firm believer in organizations and exemplifies his belief by active participation in them. He is now Vice-Chairman of the Section on Commercial Interests, A. PH. A., and at the San Francisco meeting the National Association of Retail Druggists chose him to the highest office within the gift of its members. He has been President of the Iowa Pharmaceutical Association, of the Polk County Druggists' Association, of the Retail Merchants' Association of Des Moines, and is now a director of the latter.

Denny Brann started business life as a newsboy. The proprietor of a drug store in his home city (Des Moines) permitted the youth to receive his papers in the store, and soon he became attached to the service of this establishment as delivery boy. He gave up his newspaper route, when to his messenger service, attendance at the soda fountain was added to his duties; in these capacities he worked for a number of years until he was relieved of messenger service to take charge of the fountain and advanced to junior clerk. Always industrious the latter advancement encouraged him to study pharmacy. A little later he accepted a clerkship in the Savery Hotel Drug Store; soon thereafter he passed the State Board examination and was duly registered. Mr. Brann continued as employee in this store for about ten years, and then engaged with the Monrad J. Olsen Pharmacy, where he served for a like period and, later, became manager until the business was sold to the Louis K. Liggett Company. He then purchased the store still owned by him and conducted under the name of Denny Brann Drug Company.

Industry, knowing the goods as well as the customers, and giving both proper consideration[1] have largely contributed to the success of the N. A. R. D. President; added to that Mrs. Brann shares her husband's interest in association, business and social affairs.

[1] See JOUR. A. PH. A., for July 1928, p. 680.

EDITORIAL

E. G. EBERLE, EDITOR 10 West Chase St., BALTIMORE, MD.

THE UNITED STATES PHARMACOPŒIA XI.

THE first two paragraphs of the U. S. Pharmacopœia I, read as follows: "It is the object of a Pharmacopœia to select from among substances which possess medicinal power, those, the utility of which is most fully established and best understood; and to form from them preparations and compositions, in which their powers may be exerted to the greatest advantage. It should likewise distinguish those articles by convenient and definite names, such as may prevent trouble or uncertainty in the intercourse of physicians and apothecaries.

"The value of a Pharmacopœia depends upon the fidelity with which it conforms to the best state of medical knowledge of the day. Its usefulness depends upon the sanction it receives from the medical community and the public, and the extent to which it governs the language and practice of those for whose use it is intended."

No pharmacists took active part in the preparation of the first edition of the Pharmacopœia and not until the convention of 1850 were pharmacists named as delegates—the organization of the AMERICAN PHARMACEUTICAL ASSOCIATION brought to the Pharmacopœia much-needed enthusiastic support.

Deductions may be made bearing on the revision of the Pharmacopœia with the assurance that the delegates to the Pharmacopœial Convention, meeting next May, realize their obligations and will lay the foundation for the next edition of the Pharmacopœia with the sole interest of service in mind. In order to do so each delegate should read the abstract of Proceedings of the United States Pharmacopœial Convention for 1920, or at least become familiar with the substance of the pages in U. S. P. X preceding the monographs on vegetable and animal drugs, chemicals and preparations.

It is assumed that the subject of pharmacopœial revision has received attention by every state and national association having representation in the Convention. The matter of deletions and inclusions is of no less importance than the selection of those who will comprise the membership of the Revision Committee. In the former connection parts of the recent address by Wilbur L. Scoville are worthy of careful consideration, and in the latter, that good judgment and common sense are qualities nearly as important as experience and knowledge; therapeutic usefulness and pharmaceutical necessity of the official materia medica doubtless will receive most careful thought in determining what represents the best medical and pharmaceutical service, so that a practical and useful modern scientific pharmacopœia may result.

THE CALL FOR THE ELEVENTH CONVENTION FOR THE REVISION OF THE UNITED STATES PHARMACOPŒIA.

THE official call for the United States Pharmacopœial Convention—to be held in Washington May 13, 1930—has been issued by President Reid Hunt and

Secretary Lyman F. Kebler, under date of May 25th. The text of the call follows:

In compliance with the provisions of the Constitution and By-Laws of the United States Pharmacopœial Convention, the President of the Convention hereby invites the several bodies, entitled under the Constitution to representation therein, to appoint delegates to the Eleventh Decennial Convention to meet in Washington, D. C., on May 13, 1930, and the attention of all concerned is invited to the following extract from the Constitution and By-Laws:

CHAPTER I, ARTICLE VIII, of the By-Laws of the United States Pharmacopœial Convention provides that the President of the Convention:

> "shall issue on or about the first of May of the year immediately preceding that of the decennial meeting, a notice inviting the several bodies, entitled under the Constitution to representation therein, to send delegates to the next meeting. He shall repeat the notification eight months later, and shall request the medical and pharmaceutical journals of the United States to publish the call for the said meeting."

ARTICLE II, Section 1, of the Constitution provides:

> "The members of the United States Pharmacopœial Convention, in addition to the Incorporators and their associates, shall be delegates elected by the following organizations in the manner they shall respectively provide: Incorporated Medical Colleges, and Medical Schools connected with Incorporated Colleges and Universities; Incorporated Colleges of Pharmacy, and Pharmaceutical Schools connected with Incorporated Universities; Incorporated State Medical Associations; Incorporated State Pharmaceutical Associations; the American Medical Association, the AMERICAN PHARMACEUTICAL ASSOCIATION, The American Chemical Society, the National Association of Retail Druggists, and the National Association of Boards of Pharmacy; *provided that no such organization shall be entitled to representation unless it shall have been incorporated within and shall have been in continuous operation in the United States for at least five years before the time fixed for the decennial meeting of this corporation.*"

SECTION 2 of the Constitution provides:

> "Delegates appointed by the Surgeon-General of the United States Army, the Surgeon-General of the United States Navy and the Surgeon-General of the United States Public Health Service, the Secretary of Agriculture, the Secretary of Commerce, the Association of Official Agricultural Chemists, the Association of American Dairy, Food and Drug Officials, the National Wholesale Druggists' Association, the National Dental Association, the American Drug Manufacturers' Association, the United States Division of Customs, and the University of Havana, and by the organizations not hereinbefore named which were admitted to representation in the Convention of 1900, shall also be members of the corporation. Each body and each branch of the United States Government above mentioned shall be entitled to send three delegates to the meetings of this corporation. But no such delegates as are provided for in this article shall be members until their credentials shall have been examined and acted upon as provided for by the By-Laws. Delegates admitted as members at any decennial meeting shall continue to be members of the United States Pharmacopœial Convention until their successors shall have been appointed and admitted as delegates to the ensuing Convention and no longer."

LIBRARY SERVICE.

HERBERT Putnam, Librarian of Congress, was honored by co-workers and friends before sailing for Europe, where he attended (in Rome and Venice) the first "World's Library and Bibliographical Congress." The occasion was made more interesting because the thirtieth anniversary of Dr. Putnam's leadership in the Library of Congress was celebrated. Among the speakers were

Senator Fess and Congressman Luce, and a memorial volume was presented to Dr. Putnam in which many tributes and essays were included. In speaking of the Library Senator Fess said: "In thirty years its collections of books have increased from a rather inconsequential number, as libraries go, to a rank surpassed only by two such institutions in the Old World, and will very soon pass both of these and take first rank in all the world in number of volumes now found on the 101 miles of book shelves." . . . . . "Its influence does not only permeate the Capital, but is felt throughout our own land and in many ways reaches other distant countries."

Congressman Luce expressed the thought in this way: "In this work the man we would honor to-day is the leader. He is making this the fountain spring from which knowledge shall go in divers channels to countless smaller fountains, not merely throughout our own land but throughout the world."

In replying, Dr. Putnam enlarged on the phases of the activities of the Library. Before leaving port he addressed a message to the Six Hundred directly engaged in the work of the Library, from which the closing lines are quoted: "In sharing with you the commendations of these days, and the new zests which they inspire, let me ask you to give still freer exercise to those qualities in you without which, in spite of building, books and apparatus, the Library will never express or fulfill its proper nature.

"And I ask it of you, not as subordinates, serving under me, but as associates, serving abreast of me."

The sessions of the World's Library and Bibliographical Congress were held during the latter half of June (13th-30th).

Dr. Putnam's chief topic before the Congress related to regional libraries; the thought may be applied to the possibilities of coöperative work of the A. PH. A. Headquarters Library. He stressed the library as a medium for thought instead of an index of titles, or museum, and urged that use of a book by the present generation is more important than its preservation for posterity. The Headquarters has use for both museum and present-day volumes in its service and thought is being given to the equipment of its several divisions.

The attention of publishers and authors has been called to a coöperative service by inscribing copies of their publications for the AMERICAN PHARMACEUTICAL ASSOCIATION and in this way widening the circle of acquaintance and develop the library service. Donations increase the number of volumes in local libraries and among them always will be found some that are seldom, if ever, consulted, but would serve a larger number if placed in the library of the Headquarters. Doubtless individuals, rather than realize that their libraries will be of little value after their passing, prefer to donate part of their collections to the Headquarters; others have duplicates or historic volumes which they would like to leave to posterity. These references will serve as suggestions.

Another reason for the introductory of this comment is the purpose of Dr. Putnam to extend the coöperative plans of the Library of Congress which, it is reasonable to assume, will be extended to the Headquarters Library; the same applies to the libraries of the Smithsonian Institution and of the Surgeon-General. It also speaks for the opportunity of service to retail pharmacists, and every other division of pharmacy, the Colleges and the Boards.

Very few of the State and National Associations have made provisions for

taking care of books, apparatus and historical material and will be glad to have a repository for them in the Headquarters. This will speak for the collection of such items in all of the states and contribute to the upbuilding of the Headquarters library and museum, and serves as a suggestion to these organizations—that they have a part in these projects, that their contributions represent an active participation in the institution which they have made possible—reflecting credit to themselves and American pharmacy.

"RULE OF THREE" GUARDS AGAINST POISON IVY.

"LEAFLETS three, let it be," is good advice for avoiding the misery caused by poison ivy. It may lead to avoidance of some innocent plants, but it expresses a simple rule of safety and bears the indorsement of botanists in the United States Department of Agriculture. In autumn, poison ivy may be recognized by its white, bony, berry-like fruits, in connection with its three leaflets.

Botanists know several kinds of poison-ivy plants and a wide variety of local names such as poison oak, three-leaved ivy, poison creeper, oakleaf poison ivy, climbing sumac, markweed, picry and mercury. The poison oak of the Western States is also called poison ivy. These plants, and their close relative, poison sumac, are similar in their poisonous properties.

The toxicodendrol-bearing plants, with the exception of poison sumac, are three leaved, and all have white fruits. *Farmers' Bulletin* 1166-F—from which the foregoing and part of the following is quoted—gives detailed description of the several kinds of poison-ivy plants, means of eradication of the plants, etc. The U. S. Department of Agriculture will mail a copy of the *Bulletin* (free) to those who apply.

Poison ivy grows both as a vine and as a trailing shrub, and it is found on both high and low ground. There is a variety in the South and the Southwest, the oakleaf poison ivy, with leaves having three leaflets which resemble oak leaves. Poison-ivy vines are sometimes confused with Virginia creeper. The "three-leaf" test distinguishes them, for the Virginia creeper is five-leaved. Moreover, it has blue berries, while those of poison ivy are white.

The symptoms of poison ivy are produced when the irritant poison penetrates the outer surface of the skin, and they may appear within a few hours or may be delayed until five days or longer after exposure. It should be remembered that at first the poison is on the surface of the skin and can be removed by thorough washing and rinsing, repeated several times. Careless washing, however, may serve to spread the poison. Ordinary kitchen or laundry soap which has an excess of alkali is best for the purpose, and hot water should be used. The soap should be applied freely, so as to produce an abundant heavy lather on the exposed surfaces, and then rinsed off completely. The operation should be repeated not less than three or four times. Running water is preferable or, if a basin is used, the water should be changed frequently. The hands, especially the finger nails, should receive particular attention.

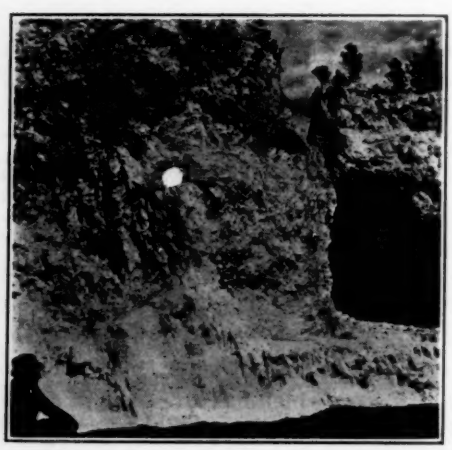
The *U. S. Department Bulletin*, of June 17th, states that a 5 per cent solution of potassium permanganate applied locally is a good remedy. (Our experience

is with a weaker solution.—EDITOR.) The stain will gradually wash off, but its removal may be hastened with lemon juice. Local applications of solutions of cooking soda or Epsom Salt, one or two teaspoonfuls to a cup of water, are ordinarily as helpful as any. Fluidextract of grindelia, diluted with 4 to 8 parts of water, is often used. These solutions may be applied with light bandages or clean cloths which should be kept moist and changed often to avoid infection. During the night, or when moist applications cannot be used, the poisoned surfaces should be carefully cleaned and dried and left exposed to the air. Do not bandage them tight. Immersing the poisoned parts for several minutes in water as hot as can be borne increases the discomfort for the moment, but a period of great relief follows.

In the early stages do not use oily ointments. The oils tend to dissolve and spread the poison. After the poison has exhausted itself a mild dressing, such as ointment of zinc oxide, is healing.

Treatment for sumac poisoning is similar. The plant is much different and is the exception to the "three-leaved rule." It is a shrub, and often grows in clumps, and only in swamps or wet ground. A general statement is made in the *Bulletin* that sumacs on high and dry ground are harmless.

MacNair's Lotion ("The Pharmaceutical Recipe Book") is used as a prophylactic and also as a remedial agent. A formula states the composition to be 25 Gm. each of ferric chloride and of sodium chloride dissolved in 250 Gm. of glycerin and enough water to make 1000 cc. of solution. Other formulas may be found in the "Pharmaceutical Recipe Book."



The Etta Mine near Keystone, So. Dakota.

THE ETTA MINE—A SPODUMENE MINE.

The Etta Mine in the Black Hills, three miles west of Keystone, South Dakota, produces between 70 and 80 per cent of the world's consumption of lithia taken from spodumene, an ore containing about 6 per cent of lithia. This mine is shipping annually about 1000 tons or more to the chemical reduction works at Maywood, New Jersey.

For years the Etta Mine has been the Mecca for geologists and students. It was primarily opened as a tin mine about 30 years ago.

The Etta is an open cut mine. The ore or spodumene is glory holed to a shaft or tunnel below. In the tunnel is a large loading and sorting room electric lighted, where work goes on regardless of weather conditions.

See your Railroad Agent for attractive rates and routes to Rapid City, South Dakota, the A. PH. A. Convention City—Week of August 26th.

SCIENTIFIC SECTION

COMPARATIVE CHEMICAL EXAMINATION OF DIFFERENT BRANDS OF ACRIFLAVINE HYDROCHLORIDE (ACRIFLAVINE) AND ACRIFLAVINE BASE ("NEUTRAL" ACRIFLAVINE).*

BY GEORGE W. COLLINS, PH.C., SC.D. AND ARANKA STASIAK, M.D.

I. INTRODUCTION.

Acriflavine and the base, "Neutral" Acriflavine are two of the several antiseptics introduced during the World War. They are dye products of the acridine series, the latter, a substance first obtained from coal-tar. The preparation and properties of 3:6 diamino-10-methylacridinium chloride (acriflavine-base) were first described by Benda.[1]

Acriflavine base was introduced by Ehrlich, who found it to possess some effectivity in trypanosome infection, hence he called it "Trypaflavine," under which name it is generally described in German literature. In England and the United States the hydrochloride of 3:6 diamino-10-methylacridinium chloride is the product more generally known as acriflavine, although the free base (which in this country is also called "neutral" acriflavine) is at times called by the same name,[2] hence the confusion in nomenclature.

The more recent use of acriflavine as a dye antiseptic is based on the pioneer work of Browning and co-workers.[3]

Subsequently much work has been done, a review of which previous to 1919 was published in the Reports of the Council on Pharmacy and Chemistry.[4] From time to time since then statements have occurred that this or that product was better. There have been published statements, particularly by E. G. Davis, to the effect that the British and French acriflavines were better than the American make, although scientific, chemical or controlled clinical evidence was lacking. In view of this, it seemed advisable to examine chemically a few specimens of American, British and French products.

Standards for the products were described in "New and Nonofficial Remedies"—1925.[5] These standards, with some additional ones, were first used to determine the relative purity of the products. The problem was first undertaken by one of us, a Fellow of the International Health Board of the Rockefeller Founda-

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* From the American Medical Association Chemical Laboratory, Chicago.

[1] L. Benda, "Ueber das 3:6-diamino-acridin," *Ber. d. deutsch chem. Gesselsch.*, 45 (1912), 1787.

[2] Scientifically speaking, the substance commercially available under the name acriflavine should have been called acriflavine hydrochloride; this recommendation has been carried out in later editions of "New and Nonofficial Remedies."

[3] C. H. Browning and W. Gilmour, "Bactericidal Action and Chemical Constitution with Special References to Basic Benzol Derivatives," *J. Path. Bact.* (July 1913), 144.

[4] "Reports of the Council on Pharmacy and Chemistry" for 1919, page 38.

[5] Generally abbreviated "N. N. R." A volume published annually by the Council on Pharmacy and Chemistry of the American Medical Association. It describes new remedies of merit which are not official in the United States Pharmacopœia. The 1928 standards, as will be noted, have been radically revised as a result of the investigations.

tion; as time did not permit completion of the work, it was taken up in greater detail by the other. The report follows:

II. EXAMINATION OF "ACRIFLAVINE."

BY ARANKA STASIAK, M.D. (BUDAPEST) CHICAGO.[1]

Original packages of the various brands of acriflavine (acriflavine hydrochloride) appearing on the open market in this country and abroad were purchased in 1926 from different sources.

The products examined in 1926 were:

1. Acriflavine—The Abbott Laboratories, Chicago.
2. Acriflavine—The Abbott Laboratories, Chicago.
3. Acriflavine—Boots Pure Drug Co., Ltd., Nottingham.
4. Acriflavine—(Heyl) National Aniline & Chemical Co., Inc., New York.
5. Acriflavine—(Heyl) National Aniline & Chemical Co., Inc., New York.
6. Gonacrine—Les Établissements Poulenc Frères; Paris.

The specimens of the National Aniline and Chemical Company, Inc., were labeled as acriflavine di-hydrochloride; those of the Abbott Laboratories as mono-hydrochloride, whereas, in the case of the other specimens, no statement was given regarding the hydrogen chloride content.

The color and appearance of the various products differed somewhat. Specimens 1 and 2 were a bright red, while the others were a reddish brown. Specimens 2 and 3 were odorless; 4 and 5 had a marked odor of acetic acid; 6 had an acrid irritating odor, as also had No. 1, though in the latter case this odor was less marked.

TABLE I.—ANALYSES OF VARIOUS BRANDS OF ACRIFLAVINE.

Brands.	Ash.	Water-insoluble matter.	Loss on drying at 100° C.	Chlorine content.	Nitrogen content.	Hydrogen-chloride content.
1 Abbott Laboratories, Chicago				22.06	12.67	11.32
	0.65[1]	0.04	14.7	*24.35*[2]	*13.97*	*12.48*
2 Abbott Laboratories, Chicago	0.96	0.37	18.4	22.35	13.15	11.59
3 Boots Pure Drug Co., Ltd., Nottingham	0.02	0.03	17.2	22.31 *23.59*	12.61 *13.34*	12.20 *12.91*
4 National Aniline & Chemical Co., Inc., New York	0.23	0.05	15.03	21.43	12.89	11.19
5 National Aniline & Chemical Co., Inc., New York	0.58	0.23	14.3	21.70 *23.17*	13.05 *13.93*	11.33 *12.09*
6 Les Établissements Poulenc Frères, Paris	0.73	0.02	12.5	23.85 *24.41*	13.00 *13.33*	12.99 *13.31*
Theoretical[3]				*23.95*	*14.19*	*12.31*

[1] Figures are reported in terms of percentage.

[2] The figures reported in italics are calculated for the specimen dried over sulphuric acid by Collins (see the following article). The other brands were not determined, owing to the lack of material.

[3] Figures are calculated on anhydrous basis.

[1] Fellow of the International Health Board of the Rockefeller Foundation. This work was done during the spring of 1926.

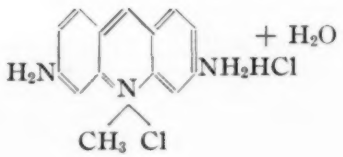
All products were found to comply with the qualitative tests described in "New and Nonofficial Remedies"—1925. Quantitative estimations made were: the loss on drying at 100° C., the water-insoluble matter, ash, chlorine, nitrogen and hydrogen chloride content.

The quantitative results are given in the foregoing table.

Particularly interesting were the p_H curves of the electrometric titrations. All curves (except the one of Specimen 2) were found to be characteristic, with only one sudden rise, indicating that the compounds appeared to be monohydrochlorides. The curve for Specimen 2 indicated a monohydrochloride, but several rises which were noted were probably due to other ingredients having a buffer action. A smooth curve, therefore, may be considered as a criterion of the purity of a product.

The chloride determinations indicated the correctness of the formula in "New and Nonofficial Remedies," namely, two chlorine atoms, one (as the electrometric titration shows) for hydrogen chloride, and the other attached to the acridine nitrogen (not as hydrochloride).

The formula which first appeared in New and Nonofficial Remedies was



It was later shown that there was no evidence of definite water of crystallization.

SUMMARY.

1. Comparative chemical analyses were made of different brands of acriflavine in 1926.

2. The results obtained show no marked difference in the purity of the different products, and do not justify the statement that the foreign product is superior to the domestic. All the products, as is to be expected, are pronouncedly acid in reaction and are in reality acriflavine hydrochloride.

3. The p_H curve of the electrometric titration may indicate the purity of the products.

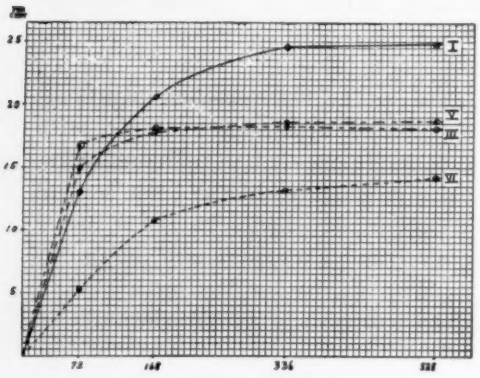
III. FURTHER OBSERVATIONS ON ACRIFLAVINE HYDROCHLORIDE.

BY GEORGE W. COLLINS, Sc.D.

It was suggested in the preceding paper[1] that the p_H curves of the electrometric titration might indicate the purity of the product; this led to further investigation on this compound. One of each of the various brands used in the foregoing paper was subjected to further analytic determinations, namely: the loss on drying at 100° C., and over sulphuric acid in a partial vacuum at various time intervals, the chlorine and hydrogen chloride content.

[1] Dr. Stasiak was unable to finish the work begun, as her time in this country was limited.

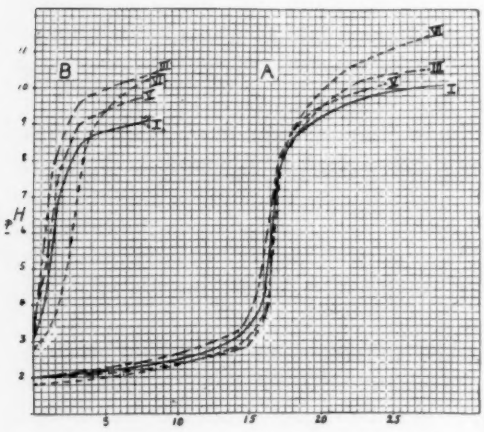
It was noted that on drying the various products at 100° C. there was a gradual loss in weight as the time element increased (see Chart I). On determining the amount of chlorine[1] present in these dried specimens, it was found to be equivalent to only one chlorine atom, whereas originally there were two chlorine atoms (see Table I). On making an electrometric titration,[2] a rather abrupt smooth curve (see Chart II, Part B, Curves) was obtained, showing that it was quite evident that the hydrogen chloride had been driven off, as well as the water on heating at 100° C., and that the percentage of hydrogen chloride lost was concordant with that of the theoretical amount; in fact, only traces of hydrogen chloride remained and the product be-



Time in hours.

Curve numbers agree with the brand numbers.

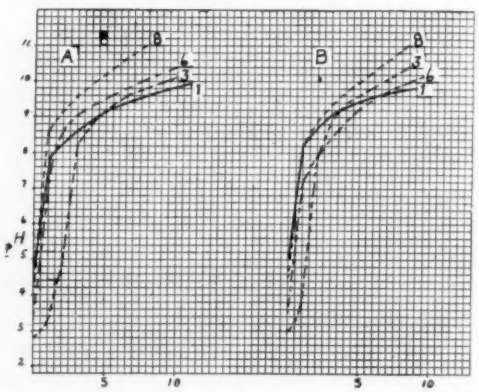
Chart I.—Rate of decomposition by heat at 100° C.



Cubic centimeters of tenth-normal sodium hydroxide consumed by 0.5 Gm.

Curve numbers agree with the brand numbers.

Chart II.—Electrometric titration curves on: *A*.—Acriflavine hydrochloride previously dried over sulphuric acid. *B*.—Acriflavine hydrochloride after drying at 100° C. for 258 hours.



Cubic centimeters of tenth-normal sodium hydroxide consumed by 0.5 Gm.

Curve numbers agree with the brand numbers.

Chart III.—Electrometric titration curves on acriflavine base (neutral acriflavine): *A*.—Undried material (calculated for the dried). *B*.—Dried material.

[1] The chlorine content was determined by a modification of the Lehman Method [Lehman, "Ueber die Bestimmung des Arsens in Salvarsan und Neo-Salvarsan," *Apoth. Ztg.*, 27 (1912), 545] for the determination of arsenic in organic compounds. The modified method has been used for several years in this and other laboratories, although a similar modification quite recently was described by Salkin [Bernard Salkin, "Analysis of Organic Silver Compounds," JOUR. A. PH. A., 16 (1927), 140]. An accurately weighed quantity (about 0.25 Gm.) of the specimen was transferred to a 250-cc. Erlenmeyer flask, and dissolved in 10 cc. of distilled water; one gram of silver nitrate, which had been previously dissolved in about 10 cc. of distilled water, was added; followed by the addition of about 10 cc. of sulphuric acid, finally about 2 Gm. of finely powdered

haved in other respects as acriflavine base (neutral acriflavine) rather than as acriflavine hydrochloride.

The specimens that were exposed over sulphuric acid in a desiccator with a partial vacuum, obtained constant weight in a shorter period of time than when dried at 100° C. The electrometric titrations made on these dried specimens produced curves (see Chart II, Part A, Curves), which were smooth and characterized by only one sudden rise (confirming the observations noted by Stasiak), indicating that all the products were monohydrochlorides and not a dihydrochloride, as stated on the label of one of the products. Furthermore, the various products produced curves (see Chart II, Part A, Curves) which practically coincide: showing that there was no difference in the products as to the hydrogen chloride content, in other words, they were all monohydrochlorides, and that the hydrogen chloride was not removed by this method of drying.

The results of the analytical determinations are recorded in Table II.

TABLE II.—COMPARATIVE DATA ON SPECIMENS OF VARIOUS BRANDS OF ACRIFLAVINE.

(A) Dried Over Sulphuric Acid. (B) Dried in an Electric Oven at 100° C.

	Specimen dried over sulphuric acid.		Specimen dried at 100° C.			
Brands.[1]	Loss on drying.	Hydrogen chloride content (calculated from electrometric titration).	Loss on drying.	Total chlorine content (including hydrogen chloride).	Hydrogen chloride content (calculated from electrometric titration).	Chlorine content[4] (calculated).
1 Abbott Laboratories, Chicago	9.34[2]	12.27	24.74	14.20	1.22	13.01
3 Boots Pure Drug Co., Ltd., Nottingham	5.45	12.34	18.04	13.37	0.39	12.99
5 National Aniline & Chemical Co., Inc., New York	6.34	11.85	18.54	13.91	1.15	12.78
6 Les Établissements Poulenc Frères, Paris	2.45	12.34	14.19	15.16	1.99	13.23
Theoretical		12.31[3]	...	...	..	11.97[3]

[1] Numbers agree with those in the preceding article.

[2] Figures are reported in terms of percentage.

[3] Figures are based on the loss of one molecule of hydrogen chloride.

[4] These figures were obtained by calculating the hydrogen chloride to chlorine and subtracting it from the total chlorine content.

REVISION OF STANDARDS.

Based on the foregoing data, rigorous standards for identity and purity were elaborated. These were submitted to the respective manufacturers for comment and then, with certain slight modifications suggested by the manufacturers, the following standards were adopted for inclusion in "New and Nonofficial Remedies:"

ACRIFLAVINE HYDROCHLORIDE.—Acriflavinæ Hydrochloridum.—Acriflavine.—3:6 Diamino-10-methylacridinium chloride monohydrochloride.—2:8 Diamino-*N*-methylacridinium chloride hydrochloride.

potassium permanganate were added in several portions, carefully agitating after each respective addition; ultimately the flask and contents were allowed to digest on the steam-bath for at least thirty minutes. The solution was decolorized with a solution of hydrogen peroxide by the aid of heat, so as to remove all traces of the manganese oxides that were formed. The precipitate of silver chloride was collected on a Gooch crucible, washed with nitric acid and water, followed by alcohol and ether, and dried to constant weight at 105° C.

[2] The usual hydrogen electrode and calomel cell were used in these determinations.

Acriflavine hydrochloride is a brownish red, odorless, crystalline powder. It is soluble in about 3 parts of water and in alcohol; nearly insoluble in ether, chloroform, liquid petrolatum, fixed and volatile oils; the solutions are dark red in color and fluoresce on dilution; an aqueous solution (1 in 250) is distinctly acid when measured by means of the hydrogen electrode.

Add a few drops of hydrochloric acid to an aqueous solution of acriflavine hydrochloride which is just sufficiently diluted to be fluorescent: the fluorescence disappears, but partially reappears on further dilution with water; add 2 drops of sulphuric acid to about 1 cc. of an aqueous solution (1 in 250) and agitate the mixture: an orange-red crystalline precipitate is produced. An aqueous solution (1 in 5) when mixed with an equal volume of a saturated sodium bicarbonate solution produces a marked effervescence (*distinction from acriflavine base*). Dissolve 1 Gm., in 250 cc. water; to a 10-cc. portion add 1 cc. diluted hydrochloric acid; add 1 cc. barium chloride solution: no precipitation occurs (*distinction from proflavine*); to another portion of 10 cc. add 1 cc. formaldehyde solution: no precipitation occurs (*distinction from proflavine*).

When tested for arsenic according to the U. S. Pharmacopœia X, the product should meet requirements for the test for arsenic (page 428, Arsenic Test). Dry about 1 Gm., accurately weighed, to constant weight over sulphuric acid in a partial vacuum: the loss does not exceed 7 per cent. Incinerate about 1 Gm., accurately weighed, previously dried over sulphuric acid: the ash does not exceed 1 per cent. Dissolve about 1 Gm., accurately weighed, previously dried over sulphuric acid in 250 cc. of warm water; collect the insoluble matter, if any, in a weighed Gooch crucible; wash the insoluble matter with hot water, dry and weigh the residue: the insoluble matter does not exceed 0.5 per cent.

The nitrogen content determined according to the method described under acriflavine base corresponds to not less than 13.7 per cent, nor more than 14.3 per cent, when calculated to the dried substance. The chlorine content, determined according to the method described under acriflavine base corresponds to the percentage of nitrogen found multiplied by the factor 1.688 (N to Cl in $C_{14}H_{14}N_3$ Cl.HCl) plus or minus 1 per cent, when calculated to the dried substance. Transfer about 0.5 Gm., accurately weighed, to a 400-cc. beaker, and dissolve in 100 cc. of water: the hydrogen chloride content determined by titration with tenth normal sodium hydroxide solution using the hydrogen electrode and a calomel cell (normal potassium chloride solution) corresponds to not less than 12.0 per cent, nor more than 12.5 per cent, hydrogen chloride, when calculated to the dried substance.

CONCLUSIONS.

1. Trustworthy results could not be obtained when the compound was dried at 100° C.

2. The compound does not contain a molecule of water of crystallization as heretofore claimed, but the water is present in varying proportions.

3. The hydrogen chloride could be completely removed at 100° C., on prolonged exposure; and only one chlorine atom remained, namely: the one attached to the nitrogen, as was suggested by Stasiak in the preceding article.

4. The hydrogen chloride is not removed by prolonged exposure over sulphuric acid in a partial vacuum, and the products so dried, yielded smooth curves with only one sudden rise, which were concordant with theory; and there was present only one hydrogen chloride molecule and not two as some authors and firms have stated.

5. Furthermore, the p_H curves of the electrometric titration appears to be an excellent criterion in the determination of the identity and purity of the compound.

6. A more appropriate name for the product was proposed and adopted for N. N. R., *i. e.*, Acriflavine Hydrochloride in place of Acriflavine.

7. Standards for Acriflavine Hydrochloride have been prepared based on work herein reported.

IV. EXAMINATION OF ACRIFLAVINE BASE (SO-CALLED NEUTRAL ACRIFLAVINE).

BY GEORGE W. COLLINS, Sc.D.

In view of the previous work it was deemed advisable to make a comparative chemical examination of the various brands of Neutral Acriflavine (as it is erroneously known). Original packages of the several brands were purchased on the open market, except one specimen of the Abbott Laboratories' brand which was obtained from the manufacturer.

The brands examined were:

1. Neutral Acriflavine—The Abbott Laboratories, North Chicago.
2. Neutral Acriflavine—The Abbott Laboratories, North Chicago.
3. Neutral Acriflavine—Boots Pure Drug Co., Ltd., Nottingham.
4. Neutral Acriflavine—Boots Pure Drug Co., Ltd., Nottingham.
5. Neutral Acriflavine (Heyl)—National Aniline & Chemical Co., Inc., New York.
6. Neutral Acriflavine (Heyl)—National Aniline & Chemical Co., Inc., New York.
7. Neutral Acriflavine—National Aniline & Chemical Co., Inc., New York.
8. Gonacrine-chloromethylate de DIAMINOACRIDINE—Les Établissements Poulenc Frères, Paris.
9. Gonacrine-chloromethylate de DIAMINOACRIDINE—Les Établissements Poulenc Frères,[1] Paris.

The products of the Abbott Laboratories were labeled diamino-methyl-acridinium-chloride; two specimens of the National Aniline & Chemical Co., Inc., were designated as (Heyl) 3-6 Diamino-*N*-Methyl-Acridinium, and a third, 3-6-Diamino-10-Methyl-Acridinium Chloride; those of the Boots Pure Drug Co., Ltd., bore no statement as to their chemical composition other than the designation, neutral acriflavine, "A modified form of acriflavine without action upon metals and specially suitable for injection;" and those of Les Établissements Poulenc Frères were labelled Gonacrine-chloro-methylate de DIAMINO-ACRIDINE, which was identical with the label that was on their acriflavine (acriflavine hydrochloride).

TABLE III.—APPEARANCE OF THE VARIOUS BRANDS OF NEUTRAL ACRIFLAVINE EXAMINED.

Brand.	Color.	Appearance.
1 Abbott Laboratories	Red	Fine uniform powder
2 Abbott Laboratories	Red	Fine uniform powder
3 Boots Pure Drug Co., Ltd.	Light reddish brown	Coarse, heterogeneous powder, with particles of a purple cast
4 Boots Pure Drug Co., Ltd.	Light reddish brown	Coarse uniform powder
5 National Aniline & Chemical Co., Inc.	Light brown	Fine uniform powder
6 National Aniline & Chemical Co., Inc.	Purple	Coarse powder with black particles
7 National Aniline & Chemical Co., Inc.	Purple	Fine powder with black particles
8 Les Établissements Poulenc Frères	Tan	Fine uniform powder
9 Les Établissements Poulenc Frères	Tan	Fine uniform powder

[1] After this chemical investigation had been completed and the new standards proposed for N. N. R., had been accepted by the manufacturers whose products had been found acceptable, it was noted in one of the trade journals (*Oil, Paint and Drug Reporter*, April 23, 1928) that negotiations had been completed for the merger of the Usines des Rhône and the Établissements Poulenc Frères to be known as Société des Usines Chimiques Rhône-Poulenc.

The appearance of the various brands differed markedly; for comparisons see Table III. All the products were found to be odorless. The solubility of the various products (1 Gm. in 250 cc. of water) differed slightly; Specimens 1 and 2 were of a light red color, while the others were of a brownish red color; all the solutions contained some floating particles (suggestive of dirt); Specimens 6 and 7 appeared to contain the greater amount (see Table III). The reaction of the aqueous solutions appeared to be neutral to congo paper but acid when determined by the electrometric method. (For p_H values see later comments.)

The various products were found to comply with the qualitative tests as described in the 1926 edition of the New and Nonofficial Remedies, except that in a few instances the intensity of color, opalescence and turbidity varied somewhat, particularly in accordance with the depth of color of the product. Upon the addition of barium chloride solution to a uniformly acidified aqueous solution of each of the brands, Specimens 2, 3 and 4 produced no turbidity; Specimen 1 yielded a faint turbidity; all others were of the same intensity, a slight turbidity increasing on standing (probably indicative of the presence of sulphate as an impurity). The quantitative estimations made were: the water-insoluble matter, the loss on drying at 100° C., the "sulphated" ash, the chlorine and nitrogen contents and electrometric titrations on the undried and material dried to constant weight at 100° C.

The results of the quantitative determinations are tabulated in Table IV.

TABLE IV.—ANALYSES OF VARIOUS BRANDS OF NEUTRAL ACRIFLAVINE.

Brands.	Water-insoluble matter.	Loss on drying at 100° C.	"Sulphated" ash.	"Sulphated" ash (calculated as sodium chloride).	Chlorine content.	Nitrogen content.
1 Abbott Laboratories (North Chicago)	0.06[1]	10.06	4.71	3.88	15.37	15.660
2 Abbott Laboratories (North Chicago)	0.06	10.17	4.73	3.89	15.33	15.4
3 Boots Pure Drug Co., Ltd. (Nottingham)	0.05	8.51	2.71	2.23	14.92	15.73
4 Boots Pure Drug Co., Ltd. (Nottingham)	0.06	8.91	11.28	9.28	18.88	14.68
5 National Aniline & Chemical Co., Inc. (New York)	0.06	8.68	9.56	7.87	17.81	15.18
6 National Aniline & Chemical Co., Inc. (New York)	0.21	8.67	3.37	2.78	15.18	15.68
7 National Aniline & Chemical Co., Inc. (New York)	0.15	8.76	4.09	3.36	15.38	15.82
8 Les Établissements Poulenc Frères (Paris)	0.08	5.66	4.90	4.03	15.02	14.81
9 Les Établissements Poulenc Frères (Paris)	0.04	6.15	4.60	3.80	15.14	14.97
Theoretical[3]	*10.00*[2]	*4.00*[2]			13.67	16.18

[1] Figures are reported in terms of percentage.

[2] Figures in italics are limits described by New and Nonofficial Remedies, 1926.

[3] Figures are calculated on the anhydrous basis.

From the results recorded in Table IV, it is particularly interesting to note the uniformity in moisture content of the products of each respective manufacturer; also that all specimens examined were within the limits required by N. N. R., 1926, except those of the Abbott Laboratories, which were just above

the limit, while the products of the Les Établissements Poulenc Frères were exceedingly low when compared with the others.

The "sulphated" ash of the various brands was found to be high, except one of the Boots Pure Drug Co., Ltd., and one of the National Aniline & Chemical Co., Inc., which fell within the limit prescribed by N. N. R., 1926. It might not be amiss to point out the pronounced difference in the "sulphated" ash content of the specimens of the products of the Boots Pure Drug Co., Ltd.,[1] which vary from 2.71 per cent to 11.28 per cent and those of the National Aniline & Chemical Co., Inc., ranging from 3.37 per cent to 9.56 per cent; this when calculated as sodium chloride, means that the consumer is paying a high price for table salt.

The p_H values for solutions of the products (0.5 Gm. in 100 cc. of distilled water, previously boiled to remove carbon dioxide) ranged between 2.8 and 4.8 (see Chart III, which contains representative curves of each of the various brands). As was expected, the curves of the electrometric titrations performed on the undried material and that dried at 100° C., in three brands were concordant, indicating that there was no appreciable titratable hydrogen chloride present. Specimen 3 (see Chart III, Curve 3), undried, showed a comparatively larger titratable acidity; however, this specimen when dried for 198 hours at 100° C. showed a marked diminution of this value, as would have been expected from the work reported on acriflavine hydrochloride. This is strongly presumptive evidence that the hydrogen chloride from the acriflavine hydrochloride had not been all removed in the preparation of this particular batch of acriflavine base. In further support of this contention, Table IV shows this specimen to have a comparative low "sulphated" ash. From the results correlated in Table IV and the curves obtained by electrometric titration (see Chart III), it is quite evident that a smooth abrupt curve might be considered as a criterion of the purity of the product.

Working with acriflavine base (neutral acriflavine) Burke and Rodier[2] have shown that various solvents yielded different p_H values. Hence, it appears evident that solutions of acriflavine base (so-called neutral acriflavine) as prepared and used in practice, might vary in p_H due to the various solvents used and in the impurities present; its germicidal action appearing weaker in an acid medium but increasing on an increase in alkalinity.[3] Furthermore, it appears quite probable that the variation in p_H might account for some of the unfavorable results reported clinically.

OPTICAL CRYSTALLINE EXAMINATION.

During the investigation one of the manufacturers had presented to the Council on Pharmacy and Chemistry a specimen of acriflavine base (Neutral

[1] It so happened that while this investigation was in progress the Boots Pure Drug Co., Ltd., submitted specimens of Acriflavine and Neutral Acriflavine to the Council on Pharmacy and Chemistry for inclusion in N. N. R. Their product, Neutral Acriflavine, bore the same control number as one of the specimens under scrutiny (see Table IV, No. 3), which was found to yield 2.84 per cent of "sulphated" ash, which agreed favorably with the one reported in the table. (See "Annual Reports of the Chemical Laboratory of the American Medical Association," Vol. 19–20 (1926–1927) for complete details.)

[2] Victor Burke and E. A. Rodier, "Preparation of Neutral Acriflavine Solutions for Intravenous Injection," *J. Lab. Clin. Med.*, 13 (1927), 231.

[3] A. H. Eggerth, "The Bactericidal Action of Acridine Dyes and the Adjuvant Effect of Serum," *J. Infec. Dis.*, 38 (1926), 440.

Acriflavine) with which the firm was desirous of replacing their present market product. The product was claimed to have been manufactured by a new process, using animal charcoal in final purification. This particular product was found to contain 12.88 per cent chlorine, considerably less than the theoretical amount present in the compound and unlike in color being a bright, light red color, and differing from the other specimens in some of the qualitative tests. It was deemed advisable, therefore, to investigate its crystalline character to ascertain whether or not it really differed from the other brands under examination. The collaboration of Dr. Albert J. Walcott, professor of mineralogy and crystallography of Northwestern University, was obtained. Two different specimens of the various brands under examination and the new proposed product were sent to Dr. Walcott for crystallographic examination. Dr. Walcott reported as follows:

1. The acriflavine base of the samples submitted exists in a crystalline state and in a state which appears to be amorphous. The "Amorphous" acriflavine base is very finely divided and is in suspension or in solid solution in the crystalline particles. The crystalline part of acriflavine base is biaxial.
2. There is also a possibility that acriflavine base consists of two different substances, *viz.*, a crystalline substance and a very finely divided substance which appears to be amorphous, and which is in suspension or in solid solution in the crystalline substance.
3. The color of acriflavine base is due to the very finely divided part which appears to be amorphous. The "amorphous" acriflavine base of the different samples varies in manner of distribution and in degree of division. This may explain the reason for the difference in color.

REVISION OF STANDARDS.

Based on the foregoing data, rigorous standards for identity and purity were elaborated. These were submitted to the respective manufacturers for comment, and then with certain slight modifications suggested by the manufacturers, the following standards were adopted for inclusion in New and Nonofficial Remedies:

ACRIFLAVINE BASE.—Neutral Acriflavine.—The base 3:6-diamino-10-methylacridinium chloride.—2:8 diamino-*N*-methylacridinium chloride.

Acriflavine Base is a brownish red, odorless, granular powder. It is soluble in about 3 parts of water; incompletely soluble in alcohol; nearly insoluble in ether, chloroform and the fixed oils; the aqueous solution is brownish red in color, and fluoresces on dilution.

Add a few drops of hydrochloric acid to an aqueous solution of acriflavine base which is sufficiently diluted to be fluorescent: the fluorescence disappears, but partially reappears on further dilution with water. Add 2 drops of sulphuric acid to about 1 cc. of an aqueous solution (1 in 250) and agitate the mixture: an orange-red crystalline precipitate is produced. An aqueous solution (1 in 5) does not effervesce on the addition of an equal volume of a saturated solution of sodium bicarbonate (*distinction from acriflavine hydrochloride and proflavine*).

Dissolve 1 Gm. in 250 cc. water; to a 10-cc. portion add 1 cc. diluted hydrochloric acid, add 1 cc. barium chloride solution: no precipitation occurs (*distinction from proflavine*); to another portion of 10 cc. add 1 cc. formaldehyde solution: no precipitation occurs (*distinction from proflavine*).

When tested for arsenic according to the U. S. Pharmacopœia X, the product should meet requirements for arsenic (page 428, Arsenic Test). Dry about 1 Gm., accurately weighed, to constant weight at 100° C.; the loss does not exceed 7.0 per cent. Dissolve about 1 Gm., accurately weighed, previously dried at 100° C., in about 250 cc. of warm water, collect the insoluble matter, if any, in a weighed Gooch crucible, wash the insoluble matter with hot water, dry and weigh the

residue: the insoluble matter does not exceed 0.5 per cent. Heat with an excess of sulphuric acid at a low temperature about 1 Gm., accurately weighed, previously dried at 100° C.; the "sulphated" ash does not exceed 3.5 per cent., when calculated as sodium chloride. Transfer about 0.3 Gm., accurately weighed, to a 500-cc. Kjeldahl flask, and determine the nitrogen content according to the method described in "Medical War Manual No. 6, Laboratory Methods of the United States Army," page 221. (The sulphuric acid digestion should be carried on at least 20 hours.) The percentage of nitrogen corresponds to not less than 15.5 per cent, nor more than 16.3 per cent, when calculated to the dried substance.

Transfer about 0.25 Gm., accurately weighed to a 250-cc. Erlenmeyer flask, dissolve in 10 cc. of water, add about 0.5 Gm. of silver nitrate, previously dissolved in about 10 cc. of water, followed by 10 cc. sulphuric acid; finally add about 2 Gm. of powdered potassium permanganate in several portions; allow the flask and contents to digest on a steam-bath for at least 30 minutes; decolorize the solution by addition of hydrogen peroxide with the aid of heat, to remove traces of the manganese oxides formed; filter the precipitate of silver chloride on to a Gooch crucible, wash the precipitate with nitric acid and water, and dry to constant weight at 105° C.: the percentage of chloride corresponds to not less than the percentage of nitrogen found according to the preceding assay multiplied by the factor 0.844 (N to Cl in $C_{14}H_{14}N_3Cl$), when calculated to the dried substance, nor more than the percentage of nitrogen found times 0.844 plus 3.0 per cent, when calculated to the dried substance. Transfer about 0.5 Gm., accurately weighed, to a 400-cc. beaker, and dissolve in 100 cc. of water: the hydrogen-ion concentration determined by titration with tenth-normal sodium hydroxide solution, using the hydrogen electrode and a calomel cell (normal potassium chloride solution) corresponds to a p_H of not less than 3 nor more than 7.

SUMMARY.

1. Comparative chemical analyses were made of different brands of Neutral Acriflavine in 1926.

2. The appearance of the various products differed markedly.

3. The compound apparently does not contain a molecule of water of crystallization.

4. Two of the manufacturers' products vary considerably in their "sulphated" ash content, and none of the brands examined were within the limit as prescribed in "New and Nonofficial Remedies," 1926.

5. The p_H curve of the electrometric titration appears to indicate the purity of a product.

6. The results obtained indicate that the product of the American manufacturers is at par with those of the foreign, and do not substantiate the claims, "that the foreign is superior to the domestic."

7. The difference in color (in the dry state) appears to be due to the fineness of the powder and the presence or absence of a very small amount of impurity removable by animal charcoal.

8. A more appropriate name was proposed and adopted by N. N. R., for the product: *i. e.*, Acriflavine Base in place of Neutral Acriflavine.

9. A complete revision of the standards of Acriflavine Base (Neutral Acriflavine) of "New and Nonofficial Remedies" resulted from this investigation.

See your Railroad Agent for attractive rates and routes to Rapid City, South Dakota, the A. PH. A. Convention City—Week of August 26th.

A PREPARATION OF DIGITALIS SUITABLE FOR INJECTION OR ORAL ADMINISTRATION.

BY ROBERT A. HATCHER AND HARVEY B. HAAG.

(*Concluded from p. 563, June Issue.*)

B. Method of Preparation Recommended.—Should it be decided to admit a preparation of the type of digisol to the U. S. P. XI, further experimentation will be necessary, and we offer the following merely as a basis for consideration, because it possesses distinct advantages over the method of the Netherlands Pharmacopœia V.

Add 1000 cc. of cold distilled water to 125 Gm. of digitalis in No. 30 powder, maintain a temperature of 25° or lower, and shake frequently during 24 hours. Filter, shake the filtrate with an equal volume of chloroform in a suitable vessel during a period of 2 hours, avoiding excessive emulsification. Collect the chloroformic layer, pass it through a hard filter, previously wetted with chloroform, distill the chloroformic filtrate to a small volume and allow the remainder of the chloroform to evaporate spontaneously. Dissolve 200 mg. of the residue in 4 Gm. of chloroform, add 75 Gm. of petroleum ether in small portions so as to obtain a flocculent precipitate, allow the mixture to stand an hour or longer, collect the precipitate and dissolve it in 20 cc. of alcohol, add enough sterile water to make 100 cc., standardize the solution, and adjust the volume so that 2 cc. will equal 1 cat unit, filter if necessary, and sterilize the solution.

When the solution is designed for oral administration, the residue may be purified as follows: Dissolve 200 mg. of the residue in 4 Gm. of chloroform in an Erlenmeyer flask, add 10 Gm. of ether and 70 Gm. of petroleum ether; cork the flask tightly and allow it to stand in a cool place several hours or over night. Collect the precipitate, dissolve it in 20 cc. of alcohol, add enough water to make the solution measure 100 cc. Standardize the solution and adjust the volume so that 2 cc. will equal 1 cat unit.

Objection may be made to the recommendation concerning the standardization, but since we do not know the ratio of activity of digisol to that of ouabain by the frog method, we cannot recommend the frog method at present. Famulener and Lyons found amorphous strophanthin 17 times as active as digitoxin by the frog method. The daily intravenous dose of amorphous strophanthin is 0.5 mg. (U. S. P. X) but the first injection of 17 times that amount of digitoxin would almost certainly cause death at once. The frogs commonly used in this laboratory are obtained from St. Albans, Vermont, and usually we have not found them well suited for the standardization of digitalis. We do not mean to imply that others should not determine the therapeutic dose based on an assay on frogs.

Sluyters says that digisol of the Netherlands Pharmacopœia may be made by the retail pharmacist. This may be possible, but there are comparatively few pharmacists who are sufficiently trained in biologic assay methods to undertake the standardization of digisol. If this were the only preparation to be assayed biologically the technic might offer no serious obstacle, but with the constantly increasing requirements of biological assay methods, the pharmacist would require a special department for this work alone. That is manifestly impossible for more than relatively few retail pharmacists in the United States.

Unfortunately, physicians are prejudiced against ouabain and strophanthin because of deaths that have followed their unwise use, and they continue to employ widely advertised proprietary preparations because they find encouragement and fancied security in following the directions of the manufacturer, and there is a practical need of an official preparation of digitalis suitable for intravenous and intramuscular injection.

The method of preparation of digisol of the Netherlands Pharmacopœia will undergo changes with criticism that will develop, hence confusion will be avoided by the use of a distinctive name for any preparation of this type that will be admitted to the U. S. P. XI.

II. EMETIC ACTIVITY.

All digitalis principles and preparations cause vomiting when the full therapeutic dose is exceeded slightly, and Eggleston and Hatcher (13) found the average emetic intravenous dose to vary from 22 per cent of the fatal with true digitalin to 65 per cent of the fatal with amorphous strophanthin. The average emetic dose of the specimen of the digitalis that they used was 46 per cent of the fatal; that of ouabain was 49 per cent, and that of crystalline digitoxin was 58 per cent of the fatal. They found digipuratum, digitalysatum and digalen relatively more actively emetic in proportion to their toxicity than digitalis.

We have therefore determined the emetic activity of the first chloroformic residue. One cat vomited 5 minutes after the intravenous injection of one-third of the average fatal dose, and three times at short intervals thereafter. Another cat failed to vomit during a half hour following the intravenous injection of one-fourth of the average fatal dose but it vomited four minutes after the intravenous injection of an additional 5 per cent of the fatal dose, or a total of 30 per cent of the fatal dose. Vomiting was repeated after one minute and again after three minutes, this dose being obviously near the minimum. One cat showed nausea within five minutes after the intravenous injection of one-half of the fatal vein dose, it vomited after two minutes and three times at short intervals thereafter. All three cats appeared depressed and all died after varying periods. One died 5 days after a dose equal to one-half the average fatal dose (as determined in the usual manner); the other two died, one after an interval of 7 days, the other after an interval of 14 days. This unexpected result caused us to repeat the experiment with the same specimen of purified residue. The emetic effects were closely similar to those observed in the first series but none of the three cats died. This is in harmony with the results in numerous experiments on persistence of action in which only 3 cats died after the injection of 75 or 80 per cent of the estimated fatal dose, until killed by the injection of ouabain after intervals of 1 to 5 days.

III. ABSORBABILITY.

a. Rate of Absorption from Muscle.—Different drugs are absorbed from muscle at widely different rates dependent upon many factors. Hatcher and Gold (14) recovered morphine sulphate from the muscle at the seat of injection in amounts up to 42 per cent of that injected after intervals of 30 minutes, and many soluble drugs are absorbed even more slowly. An interval of two hours sometimes follows the intramuscular injection of an amount of ouabain equal to twice the average fatal dose before death results.

We have used the onset of emesis and death to estimate the rate of absorption of the first chloroformic residue after the intramuscular injection of amounts equal to twice the average fatal dose. The intravenous injection of an amount equal to about one-sixth of that dose causes emesis, and the injection of one-half of the dose causes death. The results indicated that one-sixth of the total intramuscular dose was absorbed in 23 minutes, in 24 minutes and in 48 minutes, respectively, in three experiments, and that one-half of the total intramuscular dose was absorbed in 2 hours 39 minutes in one case, in 3 hours 38 minutes in another and in more than 9 hours in a third. The third animal was probably tolerant, and the rate of absorption in the other two until death was not widely different from that until the onset of vomiting, and from these experiments we concluded that roughly one-sixth of the intramuscular dose is absorbed in an average of one-half hour but that the rate of absorption declines gradually and that one-half of the intramuscular dose is absorbed within about 3 hours. The figures are not exact and the rate of distribution in the body after intramuscular injection is almost certainly somewhat different from that after intravenous injection, because different tissues fix poisons and remove them from the blood stream with different degrees of effectiveness. For example, Weiss and Hatcher (15) found that the kidneys continue to remove strychnine and to eliminate it in the urine when only the merest traces are present in the circulation.

b. Rate of Absorption from the Gastro-Intestinal Tract.—No digitalis body is absorbed at a uniform rate from the gastro-intestinal tract and a good many drugs of this group are absorbed so slowly and so irregularly that they are not suited for oral therapeutic use. Marvin and White (16) found that massive doses of convallaria or apocynum are required to maintain the digitalis action in man, and workers in this laboratory have long held that strophanthus is unsuited for oral administration because of the extreme irregularity in the rate of its absorption from the gastro-intestinal tract. We have sought to determine the approximate rate of absorption of digisol from the gastro-intestinal tract of the cat because one of us has long been interested in the problem of preparing a substitute for tincture of digitalis that would be absorbed from the gastro-intestinal tract at a more nearly uniform rate than is the tincture or the infusion.

The absorption of a chloroform-soluble substance, closely similar to digisol, was studied by Hatcher (17) and by Eggleston and Wyckoff (18) who said it is absorbed from the human digestive tract more rapidly and more nearly uniformly than are different specimens of official tincture of average biologic activity.

The results of our experiments indicate that digisol is absorbed about as well as tincture of digitalis, and they are in harmony with the observations of Hatcher, and those of Eggleston and Wyckoff just mentioned, hence they do not call for detailed consideration.

c. Interval before Action after Intravenous Injection.—The action on the heart begins within a few seconds after the intravenous injection of a large dose of digitoxin, and within two minutes after the injection of a large dose of ouabain, and the action of therapeutic doses often begins within a few minutes after intravenous injection, though the full effects may be delayed many hours. We therefore thought it worth while to determine whether the purified residue acts in this respect like digitoxin or only after a considerable delay.

A dose of 2.5 mg. of purified first chloroformic residue per Kg. of weight, equal to twice the average fatal vein dose, in 5 cc. of 16 per cent alcohol in normal salt solution was injected intravenously into a cat in a period of 22 seconds, while a tracing was being taken to show the carotid blood pressure and pulse rate.[1]

There was a gradual increase in the blood pressure beginning seven seconds after starting the injection; it reached 250 millimeters of mercury, after which it returned gradually to the previous level in 2 minutes and 15 seconds. The rate became slower immediately after the injection was completed, and 15 seconds later the slowing was marked and was attended with irregularities. There was a gradual fall of blood pressure to 100 mm., and after 32 minutes, an additional dose of 1.25 mg. of the residue per Kg. equal to the average fatal dose, was injected in 13 seconds. The heart stopped one minute later. In another nearly similar experiment, the results were nearly the same. In a third experiment, 5 mg. of the residue per Kg., in 18.4 cc. of 10 per cent alcohol (equal to 4 times the average fatal dose) was injected in a period of 19 seconds. The rate became slower during the injection, and after 80 seconds irregularities were observed which persisted until death, which occurred 5 minutes and 20 seconds after beginning the injection.

This behavior of the purified residue recalls that of digitoxin with reference to the prompt onset of action, but it resembles ouabain with reference to the delay before death occurs. It presents one rather striking contrast to the behavior of pure digitoxin, a massive dose of which produces death within a few seconds.

We believe that digisol or a solution of the first chloroformic residue would prove satisfactory in clinical use, but physicians must learn the technic of employing it, otherwise there will be disappointment following the use of ineffective doses, or accidents following the use of too much. This is true of every preparation, but it has not prevented the introduction of many proprietary preparations which have no obvious advantage over the tincture and the infusion, but which sell at prices many times greater than equivalent amounts of the official preparation, and the advantages of having an official non-secret preparation suitable for injection are obvious.

IV. PERSISTENCE OF ACTION.

The various active principles of digitalis exist in the leaf in physical combinations which undergo changes during extraction with water and under a variety of conditions, hence, a relatively slight difference in the method of preparation may cause a considerable difference in the relative amounts of the active principles extracted, and in the physical combinations in which they exist in the preparation. The physical state in which any one of the digitalis glucosides is combined exerts a marked influence on its solubility and on its absorbability from tissues, and this in turn modifies its activity.

Hatcher (5) found that the different digitalis bodies vary widely in the length of time during which the action persists in the cat, and Eggleston (19) found that the persistence of action of most of the digitalis bodies in man is closely similar to that found by Hatcher in the cat. A relatively high percentage of digitoxin

[1] The injection of a similiar dose of alcohol in normal salt solution produced practically no change in the blood pressure or in the heart rate.

causes long lasting action, whereas a relatively high percentage of gitalin and bigitalin or their genins induces a much less persistent action. We have therefore investigated the persistence of action of the first chloroformic residue by the method used by Hatcher.

The method, in brief, is as follows: The animal receives an intravenous injection of a known percentage of the average fatal dose of the specimen to be examined and after the required interval following this initial dose, the amount of ouabain required to cause death is determined. The difference between the dose of ouabain required at that time and the average full fatal dose—0.1 mg. per Kg.—is due to that part of the action of the initial dose of the substance to be tested, which has persisted. If an animal requires 0.05 mg. of ouabain per Kg., or 50 per cent of the average fatal dose, after an interval of two days following the injection of an initial dose of 80 per cent of the average fatal dose of the specimen under examination (chloroformic residue), we assume that the action of 50 per cent of the fatal dose, or 62.5 per cent of the initial dose, persists. While the figures are given in accordance with the exact calculations, it must be understood that they are only approximately correct.

Gold (20) observed that in cats the persistence of action determined 24 hours after the administration of an initial dose of digitalis was less than that after an interval of 48 hours. We have confirmed this seemingly paradoxical statement and have found a greater persistence of action on the third day after the initial dose, and even on the fifth, than after an interval of 24 hours. This can mean nothing less than that the effect—not necessarily the direct cardiac action—increases during more than 24 hours in the cat. Cloetta (6) believes that digitoxin is decomposed in the body with the slow liberation of digitoxigenin, and that digitoxigenin is about one-half as active as digitoxin. He attributes the cumulation action (which is nothing but persistence of action or increased effect) to this fact, and it is possible that the slow liberation of digitoxigenin from digitoxin fixed in tissues outside of the heart is partly responsible for the increasing action after an interval of 24 hours. Cloetta's theory is based on pure assumption, and there is no proof that digitoxigenin is liberated in the animal body or that it is responsible for the so-called cumulative effects of digitoxin and digitalis, and, on the other hand, so-called cumulation is seen with other digitalis bodies and which do not yield digitoxigenin.

We have not attempted to determine the exact duration of the persistence of action of digisol or that of the first chloroformic residue (and one may be sure that it varies rather widely in different animals), but two series of experiments were conducted to show the persistence of action. In the first series each of 8 cats received an intravenous injection of 80 per cent of the average fatal dose of the first chloroformic residue of the experiment of December 31, 1928, which was prepared from a mixture of 5 specimens of digitalis. The results show that the average action persisting was equal to 58.4 per cent of the initial dose after an interval of 2 days; to 77.8 per cent after 4 days, and to 69.6 per cent after 5 days. In the second series each of 15 cats received an intravenous injection of 75 per cent of the average fatal dose of the chloroformic residue obtained from the experiment of January 10, 1929. In the second series the action persisting after 24 hours was equal to that of 62.4 per cent of the initial dose, and to 88.4 per cent after 2 days;

one of those tested after three days was obviously tolerant, and three others tested at the same time showed an average of 56.9 per cent of persistence of action. The average in two animals tested after 4 days was 62.5 per cent; and that of two after an interval of 5 days was 61.4 per cent.

It is probable that the persistence of action that is due to gitalin and bigitalin diminishes rapidly, and that that due to digitoxin diminishes more slowly, but one may assume that much the greater part of the action disappears within ten days.

V. SUMMARY AND CONCLUSIONS.

1. The theoretical basis of the method employed in the extraction of the Netherlands Pharmacopœia V is discussed and it appears that the first extraction with chloroform is designed mainly to extract gitalin, with some bigitalin and digitoxin, and that the second is designed to extract the hypothetical substance, digitalein.

2. No active principle is extracted by the treatment of the powder with chloroform in the second part of this process.

3. There is no pure principle called digitalein and we have discussed briefly the composition of commercial digitalein.

4. It is not necessary to extract the digitalis powder with water during more than 24 hours.

5. It is not necessary to shake the aqueous filtrate with chloroform during more than 2 hours in a capacious flask or other vessel. The emulsion formed separates on standing, or it may be separated almost completely into its components by shaking with an excess of fresh chloroform.

6. It is not necessary to maintain a temperature lower than 25° during extraction with water and with chloroform.

7. A method of preparation is offered as a basis for further study.

8. The weight of the residue of the first chloroformic residue and its relative activity vary with different specimens of digitalis and also with the method of drying, because it contains some volatile oil, part of which is expelled by heat.

9. The residue of the chloroformic extract may be purified by dissolving 200 mg. in 4 Gm. of chloroform, adding 10 Gm. of ether and 70 Gm. of petroleum ether and collecting the precipitate.

10. The purified residue obtained from different specimens of digitalis is of nearly constant activity, about 1.25 mg. being equal to 1 cat unit.

11. The chloroformic residue is more soluble in 10 per cent alcohol with distilled water than in normal salt solution to which 10 per cent alcohol has been added.

12. The solubilities of active principles vary with slight differences in the amounts of impurities present, and relatively slight differences in the method of procedure (temperature, etc.) result in notable differences in the amount of impurities present in the unpurified residue.

13. Digisol (or the first chloroformic residue) consists mainly of impure gitalin with small amounts of impure bigitalin, digitoxin and genins of the gitalin group, together with traces of saponin and other impurities of unknown composition.

14. Digisol dissolved in sterile normal salt solution and kept in tightly corked bottles loses little of its activity at room temperature within a period of six months.

15. The gitalin fraction of digisol or the purified residue is rapidly decomposed by 0.2 per cent hydrochloric acid at body temperature. The remaining fraction is more resistant to hydrochloric acid.

16. Digisol, or the first chloroformic residue, is a little more actively emetic than the tincture of digitalis U. S. P. in proportion to the toxicity shown by standardization on cats.

17. The rate of absorption from the gastro-intestinal tract is comparable to that of tincture of digitalis. The rate of absorption from the muscle is not sufficiently rapid to point to the use of the purified residue or digisol by intramuscular injection in emergencies requiring immediate therapeutic effects, but this is a crucial question (for this type of drug) and it requires critical clinical investigation.

18. The action following the intravenous injection begins at once but the full effects are not induced so rapidly as after a very large dose of digitoxin. The residue is well suited for intravenous injection in emergencies. The degree of purification to insure the optimum solubility requires further study.

19. The persistence of action is greater than that of strophanthin or ouabain, but apparently less than that of digitoxin or digitalis.

20. The distinction has been drawn constantly in this paper between the purified and the unpurified chloroformic residues, but the purified residue is only relatively pure, and the unpurified contains no impurity that is in the least injurious, but, on the contrary, the impurities present are of distinct advantage in increasing the solubility of the active principles in water.

21. The present investigation is only a preliminary study and numerous minor problems require further investigation before a preparation of the type of digisol is admitted to the Pharmacopœia.

CONCLUSIONS.

A chloroformic extract of a cold infusion of digitalis may be prepared of nearly uniform activity. It contains gitalin with small amounts of bigitalin, digitoxin and genins of the gitalin group, all in combination with useful impurities. A solution of the residue of this chloroformic extract, similar to digisol, is suitable for intramuscular or intravenous injection or for oral administration.

It is probably desirable that such a preparation be admitted to the Pharmacopœia, for reasons that have been discussed, though it has no demonstrable advantage over crystalline ouabain from a purely theoretical standpoint. It is essential that the therapeutic dose be established accurately before such a preparation is made official in order to avoid disappointment and accidents. A clinical investigation of the purified and the unpurified chloroformic residues is planned with a view to determining the dosage, including the necessary and permissible frequency of repetition of fractional doses based on observations of the persistence of action in man.

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A CONSIDERATION OF THE METHODS AND RESULTS IN THE STANDARDIZATION OF THE OVARIAN HORMONE.

BY HOWARD T. GRABER.

In view of the increasing interest in the estrus-producing principle and of the fact that the subject has been considered from various standpoints, it seems advisable to consider, in a collective way, or to analyze the present methods used in the physiological standardization of this remarkable substance. Prior to 1917 it was difficult by external observations to determine the stage of the estrus cycle of either rats, mice or guinea-pigs.

In 1912 Adler (1) stated that by injecting watery extracts of ovaries into animals he was able to produce all the symptoms of estrus. Later, Iscovesco (2), Fellner (3) and co-workers, and then Herman and Frankel (4) carried on this line of work.

In 1917 Stockard and Papanicolaou (5) showed that it was possible to follow the cycle in the guinea-pig by microscopical examination of the cells contained in the vaginal smear.

In 1922 Long and Evans (6) applied the principle to a study of the conditions in the rat. In the same year Allen (7) studied those in the mouse.

In 1923 Hartman (8) applied the same principle to the conditions in the opossum. This same year, Allen and Doisy (9) obtained a solution containing the active principle from the follicular fluid obtained from pig ovaries.

Parkes (10) applied the principle to the study of the conditions in the mouse in 1926.

There have been many other workers in this field notable among whom should be mentioned Laqueur (11) Dodds, Dickens (12) and co-workers, and Zondek and Ascheim (13).

As our experience with different products has advanced, naturally there have been developments in different laboratories which undoubtedly are an advantage. This, however, we feel would be lost unless these differences in technique and procedure are reconciled with one another. In other words, in order for the findings in this laboratory to be compared with those of another there must be some common ground upon which they stand.

With this in mind, it seems advisable to set down, as concisely as possible, a statement about each of the current procedures used in the evaluation of products containing the estrus-producing principle.

First of all, all of these methods are based fundamentally on the work of Long and Evans who demonstrated the fact, in 1922, that the estrus cycle in the rat could be followed by the vaginal smear method.

There has been quite general agreement regarding the weight and conditions of the animals used in these experiments—white Albino rats ranging in weight from 120 to 160 Gm. are ovariectomized and allowed to recover. Two weeks after the operation they are studied for a certain period, usually seven days, for the microscopical evidences which are used to determine the various stages of estrus, and thereafter if they have been proven to be in the "resting" stage they receive subcutaneous injections of the product it is desired to study, and the microscopical examinations of the vaginal smears are continued.

Right here comes the principle variation in the methods of the investigators, and it is because of these differences and their possible importance that this matter has been given consideration.

Since the reaction of an animal to a given physiological stimulus depends not only upon the stimulant, but also upon the responsiveness of the animal to that stimulant, naturally the time of the injections, their relation to one another as well as the dose must be taken into consideration.

Doisy (14) has suggested the following:

> Vaginal smears of female rats weighing from 90 to 110 Gm. at an age of 7–8 weeks were made daily for a period of at least two weeks to determine the regularity of the estrus cycle. Only those animals having regular cycles are used. The ovariectomy was performed under deep ether anæsthesia, aseptic precautions being observed. Daily vaginal smears were made for two weeks following ovariectomy to determine whether all ovarian tissue had been removed. Negative smears were obtained in every case, indicating that the ovariectomy had been complete.

Injections.—In earlier work it was attempted to simulate the ovarian activity by injecting preparations of the hormone in three portions given at four-hour intervals.

Their test animals are used once a week thus corresponding roughly to the length of the normal ovarian cycle. Prime the animals with two R. U.

One week later, test the reaction of each animal by injecting 1.3 R. U. If the smears are negative discard the animal.

A week later, test the reaction to 0.70 R. U.; if positive smears occur discard the animal.

Use each animal for no longer than four months.

In attempting accurate assays, prime all animals by injecting 1.5 R. U., if the reaction of the preceding week was negative.

Use a sufficient number of animals. If 75 per cent of the animals injected with the same volume give a positive reaction, consider that the amount injected contained 1 R. U. A rat unit being defined as the minimum amount of hormone that will induce full estrus growth, as judged by the smear method, in the genital tract of a spayed adult white rat weighing about 140 Gm. forty-eight hours after the first of *three* one cc. injections given at intervals of from four to six hours.

Allen, Dickens, Dodds and Howitt, on the other hand, observe the following technique:

Method.—All standardizations have been performed upon ovariectomized rats. When a weight of 140 Gm. is reached the ovaries are removed and vaginal smears are taken for 2 weeks. If no signs of cyclical activity are observed, the animals are then put into use. *Six* doses of 0.2 cc. each are injected into the animals, the preparations being diluted to contain approximately 1 unit in 1.2 cc. The injections are made as follows: first day, 9 A.M. and 6 P.M.; second day, 9 A.M., 3 P.M. and 9 P.M.; third day, 9 A.M., only. Smears are taken at 9 A.M. on the first and second days; at 9 A.M. and 6 P.M. on the third day; and again at 9 A.M. and 6 P.M. on the fourth day. It is rare for a rat to attain estrus after the evening of the fourth day, and often signs of a return to the diestrus condition are already present in the sixth smear. A minimum of 20 rats and, where possible, 100 rats are used for each batch. Smears have been stained with hæmatoxylin and eosin, since this enables a permanent record to be kept of the response elicited by various preparations.

Interpretation.—One unit of activity is that quantity of material required to produce a full estrus response in 50% of the rats used (Coward and Burn). Estrus has been taken to be present when cornified cells only are shown in the vaginal smear.

Bugbee and co-workers observe entirely different details of injections as follows: In carrying out the standardization, ovariectomized rats are used. *Eight* injections are given to the animals, four daily for two days, estrus being determined by examining the cell forms found in vaginal smears taken from the rats on the third and fourth days of the test. One rat unit is defined as the minimum amount of extract which will produce estrus in the ovariectomized animal of 140 Gm. weight.

Laqueur prefers the mouse as a test animal to the white Albino rat, others check the reaction in the monkey.

Now while the difference between these procedures may not be great, there is a difference and because of this it seems that some effort should be made to standardize the standardization, and make it possible for those who are interested, both in the manufacture as well as the standardization of these products, to make satisfactory comparisons of their physiological activity.

Bear in mind that if a product is standardized in harmony with, shall we say, the Allen and Doisy method the result will probably vary from the results of the apparently similar, but really considerably different, method of Dodds and the results reported by the Dodds' method will no doubt produce a higher rat unit and therefore a lower dosage.

For instance, it is claimed that the same relative dose given in three injections during the period of 48 hours has an apparent potency much less than the same dose given in eight injections over the same period of time.

Clinical use of this ovarian hormone has shown that it is necessary to give relatively large doses in order to get results, and a reported potency of 25 rat units obtained by distributing the dose over eight injections would in reality be reported much lower than when tested by the method which distributes the dose over three injections.

Take for example the standardization of certain biochemical substances like ferments; much misunderstanding has already been brought about by the differences of procedure in applying what is presumed to be the same method. In biochemistry where physiology is involved, as in the standardization of a

preparation by animal experiments, other factors enter in which have to be appreciated.

It is for this reason that it becomes necessary for all standardizing this principle to adopt a uniform procedure in the assay of this ovarian hormone.

I am not in agreement with Bugbee (15) in his suggestion for testing aqueous colloid solutions and true aqueous solutions by giving eight subcutaneous injections, 4 on each of two successive days, because of what has already been recorded.

In view of what has been said, I propose the following procedure for routine adoption:

1. Select normal healthy white rats of about 100 Gm. in weight.
2. Determine that the animal has a normal cycle, before spaying, by examining the vaginal smears daily for a period of two weeks.
3. Perform complete double ovariectomy and examine the vaginal smears daily to determine that the animal continues in the diestrus or resting stage.
4. Allow one week for recovery from the operation.
5. The food of the rats should be well balanced and contain a sufficient amount of vitamines.
6. For aqueous colloid or true aqueous solutions, three equal injections are given at intervals of four hours. The total amount injected should be about 1 cc. As far as I know there is no ovarian hormone to-day which is dissolved in oil, so it seems unnecessary to consider oil-soluble products.
7. Take vaginal smears 36 and 48 hours after the first injection.
8. The rat should be as near 120 to 160 Gm. as possible, if over or under weight, the correction of Bugbee (15) for weight should be applied.
9. Be sure the rats are primed up. They should be injected at frequent intervals, when not under test, to be sure they remain responsive to the material.
10. Rats should not be used for a longer period than four months. Rats over weight should be used for the rough preliminary assay, checking finally against a series of rats of approximately 140 Gm.
11. In interpreting the smears the reaction is to be classified as positive when the bulk of the smear consists of cornified cells.
12. Use from 9 to 12 rats for a test and give three the same dosage.
13. Two out of three rats given the same dosage should show a positive reaction.
14. Do not use the same rat more often than once every seven days.

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A METABOLIC CAGE FOR DOGS.*

BY A. RICHARD BLISS, JR.[1]

The cages, described herein and used in the laboratories of the University of Tennessee Colleges of Medicine and Dentistry and School of Pharmacy at Memphis during the past college session, have proved very satisfactory. Long experiences with stock cages and with cages constructed in the Shop of the University of Tennessee, all of which showed some marked disadvantages from the standpoints of animal comfort, care, accurate work and costs, resulted in the invention of the cages under discussion.

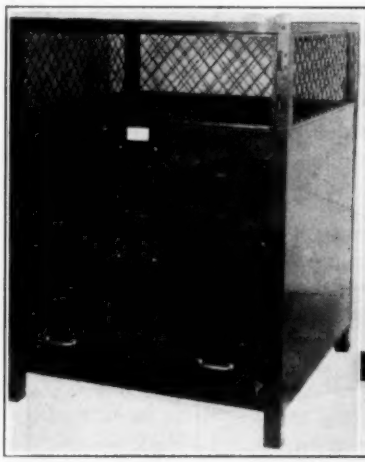

Fig. 1.

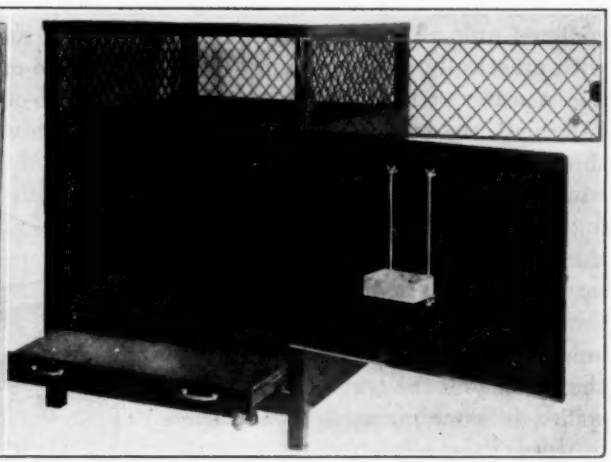

Fig. 2.

These cages, which may be built to any desired dimensions, provide isolating compartments for dogs of any size, cats, rabbits, monkeys or other small animals. They are constructed so as to furnish maximum ventilation and visibility, while affording complete comfort to caged animals. The high degree of comfort provided is conclusively shown by the fact that large dogs, which have been confined by the author in cages of this type 3 ft. x 3 ft. x 3 ft., have given none of

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* Scientific Section, A. PH. A., Portland meeting, 1928.

[1] Dean of the School of Pharmacy; Chief, Division of Pharmacology and Materia Medica, College of Medicine, University of Tennessee, Memphis.

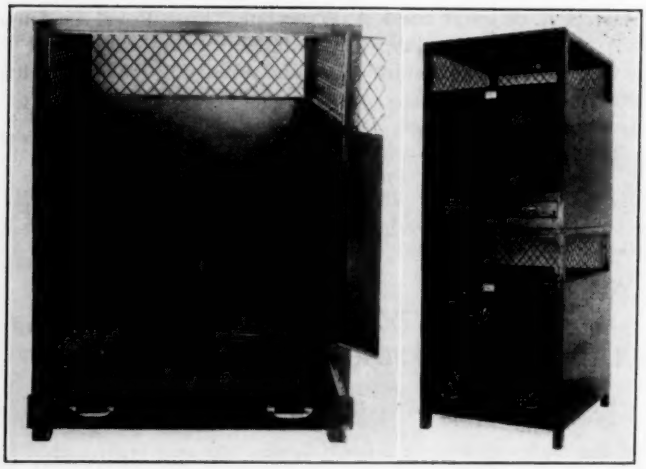

Fig. 3. Fig. 4.

the usual noisy evidences of discomfort and fretfulness.

The cages are constructed of sheet metal (filing cabinet steel) which is covered with baked enamel of desired color, and they present a most pleasing appearance. Figure 1 presents a general view of one of the cages. The back and sides are of steel plate with heavy wire-mesh toppings. The mesh toppings may be made of any desired height. The top of the cage is of steel plate or of wire mesh as desired. The front is a duplex door, the lower unit being a sheet metal door, and the upper a wire-mesh door, each provided with a fastening bolt. The sheet metal door carries a large label holder and has an angular upper edge offset laterally inward, against which the wire-mesh door closes at the bottom. (See Fig. 2.) This arrangement permits close unobstructed observation of the confined animal and the placing of food, water and other materials in the cage with practically no opportunity for the animal to escape.

A water or food tray is carried on the inside of the lower door. (See Fig. 2.) If desired, the tray may be fastened to one of the sides. The tray is attached to threaded rods, the upper ends of which are squared. By simply turning the squared tops of the rods with the fingers the tray is caused to travel up or down to a height which is within comfortable reach of the particular animal under observation, and without the liability of the tray contents being spilled or contaminated by the urine or feces of the animal.

The floor supporting the animal consists of a readily removable and replaceable false bottom of suitable wire mesh, which permits the free passage of the urinal discharges of the animal. The removable floor rests on a ledge which is provided with a flange directed laterally inward and downward to deflect liquid passing through the mesh floor away from the lower sides of the cage body. (See Fig. 3.)

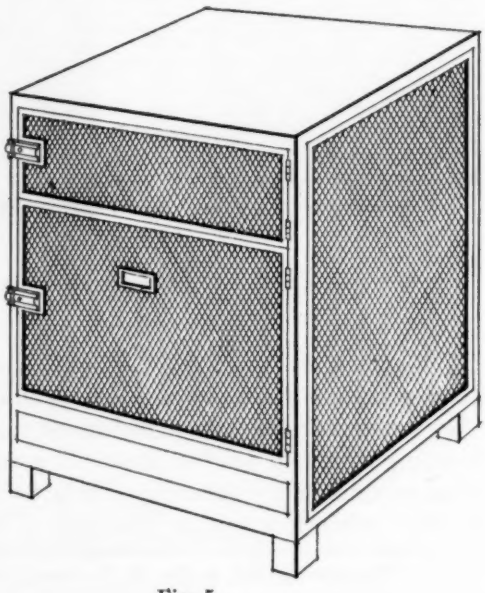

Fig. 5.

Under the floor or false bottom is a removable sliding hopper drawer with its inner bottom sloping in all directions toward one outer corner which is provided with a small drain or draw-off cock. Accordingly, all liquid discharge from the animal will pass into the hopper drawer where it is accurately and completely collected, and from which it may be completely drawn off at will. The construction material insures against corrosion and contamination of the collected fluids. (See Figs. 2 and 3.)

The legs of the cages are removable so that they may be stacked in tiers. (See Fig. 4.) Castor bases may replace the legs.

The construction and the materials of the cages make them practically indestructible, and permit of easy thorough cleansing and sterilization by disinfecting and cleansing agents, boiling water and steam. The weight of the cages permits of easy moving. The cost is surprisingly low.

By an easy modification of the foregoing construction a very inexpensive cage is provided suitable for simple storage and isolation. Full mesh panels may be used for the sides and door of the cage. The back and the top may be made of solid steel or mesh as desired, and the bottom of solid steel in place of mesh. No hopper drawer is then needed. (See Fig. 5.)

ASSAY OF GROUND FLAXSEED FOR NON-VOLATILE, ETHER-SOLUBLE EXTRACTIVE.*

BY JOSEPH L. MAYER.

The U. S. Pharmacopœia X, on page 205 states that "linseed yields not less than 30 per cent of non-volatile, ether-soluble extractive" and on page 206 directs that the assay be made "as under Non-Volatile, Ether-Soluble Extractive on page 466." The method on page 466 is as follows:

"Extract completely 2 Gm. of the prepared drug (paragraph VI) dried over sulphuric acid for not less than twelve hours by subjecting it during twenty hours, to the action of dehydrated ether (page 475) in continuous extraction apparatus. The weight of the extract, after drying in a desiccator and then at 110° C. until of constant weight, represents the non-volatile portion of the extract."

While the continuous extraction apparatus is frequently permitted to run all night and in this way the assay quickly completed, it is often a risk to follow this procedure due to fear of an accident of some sort, and therefore the work is carried on during working hours, three working days being consumed in the assay.

With the object of shortening the time required for the assay I attempted to make the analysis by the following procedure:

A.—One Gm. of ground flaxseed was placed in a 2-oz. bottle, 30 cc. of ethyl ether added and after being corked the bottle was frequently shaken from February 5th until April 9th when the liquid was decanted on a filter, the filtrate being collected in a tared glass crystallizing dish. When the liquid had run through, the residue in the bottle was spritzed on to the filter by means of ether from a wash bottle and when the liquid had run through the bottle and filter with contents repeatedly washed with 10-cc. portions of ether employing a total of about 75 cc. After evaporating the ether on the steam-bath, the material was heated to constant weight.

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* Read before annual meeting of the New York State Pharmaceutical Association, June 1929.

The assay showed the presence of 30.547% non-volatile, ether-soluble extractive.

B.—Another sample of 0.500 Gm. was placed in a 100-cc. beaker, 20 cc. of ether added, the material stirred by means of a glass rod for about ten minutes, and then allowed to stand for about one hour when it was poured on a filter. The filtrate was collected in a tared glass crystallizing dish. The filter and contents were then washed with ether employing about 75 cc. in all. After evaporation of the ether, the dish and contents were weighed.

The presence of 30.600% of non-volatile, ether-soluble extractive was indicated.

In an effort to determine whether these findings, which checked closely, represented the actual amount of ether-extractive, I made two assays employing two Soxhlets, following the U. S. P. directions with reference to twenty hours continuous extraction, ether, etc.

C.—Employing a Soxhlet with a stop-cock on side, an Allihn condenser and all ground joints.

The assay indicated the presence of 37.032% of non-volatile ether-soluble extractive.

D.—Employing a Soxhlet, which did not have a glass stop-cock on side, had a Hopkin condenser and all ground joints.

The assay indicated the presence of 37.023% of non-volatile, ether-soluble extractive.

SUMMARY.

These figures clearly indicate that in order to obtain accurate results in the determination of non-volatile, ether-soluble extractive of flaxseed it is necessary to follow the method of the U. S. P. and employ some type of continuous extraction apparatus.

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AUSTRALIAN SANDALWOOD OIL COMPARED WITH THE OFFICIAL.*

BY EDWARD SWALLOW.

The various kinds of sandalwood oils, from other sources than the East Indian, or official Sandalwood Oil, which is obtained from *Santalum album*, have caused more or less confusion in the minds of both the pharmacists and government authorities in most countries of the world.

Generally speaking, most of the foreign pharmacopœias recognize only the sandalwood oil that is distilled from the wood of the *Santalum album;* therefore, it follows that in the countries where this drug is recognized as the source of the official oil, other oils obtained from other woods may not be used for the recognized product.

* Presented to Scientific Section, A. PH. A., Portland meeting, 1928.

As the santalol content is the chief medicinal constituent of the official drug, and the standard requirement of most pharmacopœias calls for not less than 90 per cent of this constituent, the "Sandalwood Oils" that do not contain santalol, or contain a lesser percentage of it, evidently are mis-named. On the other hand, any sandalwood oil obtained from a recognized species of *santalum*, such as the Australian sandalwood oil, that is distilled from *Santalum spicatum*, having a 90 per cent to 94 per cent santalol content, would appear to meet the legal requirements of this drug, even though it is obtained from a non-official variety of sandalwood.

From a medical standpoint, the difference existing as to the particular source of Australian sandalwood oil, obtained from *Santalum spicatum*, and the East Indian sandalwood oil, distilled from *Santalum album*, does not matter when the two oils are considered as therapeutic agents, and that is all the medical profession is concerned with.

This Australian sandalwood oil has received the endorsement of the medical profession in Australia. A recent report from a leading specialist in venereal diseases in London, England, not only supports this endorsement, but states that this Australian sandalwood oil is equal in medicinal value to the official sandalwood oil and is better tolerated by the patients.

Professor Emilé Perrot, of Paris, France, has examined this particular Australian sandalwood oil, and reports that "the oil of Australian sandalwood, *Santalum spicatum*, seems to give identical results, medicinally, with the oil of *Santalum album*, with the added advantage of being, in general, better tolerated by the patient."

Dr. Percy May, of London, reports on this Australian sandalwood oil as follows:

> "Although such properties as optical rotation are interesting to the chemist, as tending to throw some light on the chemical relationship of the oils from different sources, the crucial question from the pharmaceutical point of view is that of therapeutic effect. If West Australian sandalwood oil is found in practice to be as effective, medicinally, as the East Indian oil, then there can be no good reason why it should not be included in the pharmacopœias of the world, in view of the fact that the uniform quality of good commercial oils enables a specification to be drawn up to exclude all but the good oils."

It may be well to point out that certain producers of Australian sandalwood oil, distilled from *Santalum spicatum*, have arranged with the Australian government authorities through the General Control of Customs, Melbourne, to standardize all of this particular kind of oil before being used in Australia or exported. Such Australian sandalwood oil, obtained from *Santalum spicatum*, has a guarantee of purity and quality that, in addition to its santalol content being constant and more than meeting the requirements of the official sandalwood oil in this respect, justifies its inclusion in all pharmacopœias, either as a separate item or included in the legal requirements covering the East Indian sandalwood oil.

The suggestion is offered—that as this Australian sandalwood oil is the equal in medicinal value to the official sandalwood oil, and guaranteed by the Government as to its purity and strength and freedom from adulteration—"Medicinal Sandalwood Oil," should include both the East Indian oil, and this standardized Australian sandalwood oil, so that either may be used in medicine.

The writer, an experienced hospital pharmacist, is of the opinion that the physician, when prescribing for his patient, has only one thought—the action of the drug he orders. Differences in rotations, and the fact that one drug may be obtained from one member of a certain family, and another from another member of the same family—both having a common botanical origin—does not interest the physician; he wants results.

There is no doubt about this Australian sandalwood oil being fully equal in medicinal value and therapeutic effect to the official sandalwood oil and, moreover, is better tolerated by the patient. The mere fact—that owing to sandalwood oil being introduced into medicinal use from India, where in the regions of Mysore, and other territory, "the rulers of the country have from time immemorial, exercised a monopoly over *Santalum album* and its oil"—should not prevent the legal use of Australian sandalwood oil as a recognized medicine, if it meets the requirements of the medical profession in therapeutic value.

In regard to the chemical constituents of the official sandalwood oil, distilled from *Santalum album*, the percentage of santalol furnishes the basis of the official test; therefore, the following analyses made by various well-known chemists, and one from the Australian Government Customs Control, are presented.

SANTALOL CONTENT OF AUSTRALIAN SANDALWOOD OIL.

Seil, Putt & Rusby, New York	Percy May, London	Australian Customs	W. H. Simmons, London	Requirements of U. S. P.
1928	1918	1927	1927	
94.65%	90–96%	92.5–96%	95%	90%

The conclusion is reached by the author that, as the value of sandalwood oil as a medicinal agent depends entirely on its santalol content, Standardized Australian sandalwood oil, obtained from *Santalum spicatum*, should receive recognition in the Pharmacopœia so that it may be legally used as a medicine in the United States.

SILVER-ION CONCENTRATION OF COLLOIDAL SILVER GERMICIDES, III.*

THE TITRATION OF SOLUBLE IODIDES IN COLLOIDAL SILVER IODIDE.

BY RALPH B. SMITH AND W. G. CHRISTIANSEN.

That colloidal silver iodide contains a small excess of free sodium iodide is evident when one considers that the p_{Ag} of colloidal silver-iodide preparations as will be shown in this paper is between 12.5 to 14.0 and the silver-ion concentration of pure silver iodide as was shown in the first paper of this series[1] is equivalent to a p_{Ag} of 7.95. It is also possible to demonstrate the presence of soluble iodides by dialyzing the silver-iodide preparation against distilled water in a beaker and titrating the dialysate but this method has never given satisfactory results.

Previous work[1] had shown that it was possible to obtain smooth curves when colloidal silver preparations were titrated with soluble iodides using a silver elec-

* Scientific Section, A. PH. A., Portland meeting, 1928.

[1] JOUR. A. PH. A., 14 (1925), 10.

trode. Since a titration of the soluble iodide in a colloidal silver preparation with $AgNO_3$ would simply be a reversal of this titration, a series of these titrations were made against various experimental batches of colloidal silver iodide. The electrodes were prepared by treatment with hot 1.0% KCN as previously described.[1] In the first of these titrations 100 cc. of colloidal silver iodide $N/10$ with respect to silver was titrated with $N/10$ silver nitrate. This concentration of silver nitrate proved too strong but the titration was continued until 100 cc. of the silver nitrate had been added to 100 cc. of the colloidal silver-iodide solution. At this point the p_{Ag} of the solution was equivalent to that of a $N/20$ silver-nitrate solution. This indicates that there was no adsorption of silver ions by the colloid. A series of seven samples $N/10$ with respect to silver were titrated with $N/100$ silver nitrate and with this strength of reagent a relatively sharp break occurs in the curve at the point where all the soluble iodide has been titrated. The end-point may be determined either by plotting the titration curve or by the method of increments. This method consists in determining the value of the increments of voltage for each equal addition of titrating reagent. The end-point lies within the range of the largest increment and the position of the end-point within the increment can be determined accurately as follows. Let the three increments considered be called A, B and C in the order of titration with B the longest increment. Then the position within increment B will be $B \times C/A + C$. This is added to the reading at the end of increment A to give the true end-point. This method of increments is shorter and fully as accurate as plotting the titration curve. At the same time that the samples were titrated the conductivity of the solutions to be titrated was also determined in order to detect the presence of any other conducting material beside soluble iodides which might be present in the solution. Sample G was prepared in a different manner from the other samples and was known to contain other inorganic salts besides sodium iodide and it will be noted that this fact is evident from the increased conductivity of this sample. The following is a table of the results of the titrations.

TABLE OF TITRATIONS.

Sample.	Specific resistance ohm cm.[1]	p_{Ag}.	Cc. $N/100$ $AgNO_3$.	Per cent NaI.
A	385	12.54	0.63	0.26
B	396	12.86	0.996	0.41
C	412	13.12	1.610	0.67
D	143	14.03	12.80	4.90
E	.295	13.10	1.96	1.96
F	395	13.31	1.83	1.83
G	235	12.61	1.90	0.46

CONCLUSION.

1. A method has been developed for titrating soluble iodides in the presence of colloidal silver iodide by the use of the silver electrode.

2. Where other conducting materials are not present in the colloidal silver iodide the conductivity follows closely the soluble-iodide content.

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THE CHLORINE PRODUCTIVITY OF MIXTURES OF POTASSIUM CHLORATE AND TINCTURE OF FERRIC CHLORIDE.*

BY JOSIAH C. AND BERTHA L. DEG. PEACOCK.

Prescriptions which call for the mixing of potassium chlorate and tincture of ferric chloride are quite common. Usually with these ingredients there is prescribed glycerin, simple or flavored syrup, elixir or other alcoholic or aqueous diluent, and alum, potassium citrate and other additions may be ordered.

Some pharmacists are of the belief that the doctor expects chlorine to be produced and dispensed in all such mixtures. Others hold the opinion that no chlorine is wanted, and besides, that none will be present in the finished prescription, unless the potassium chlorate and tincture of ferric chloride are heated together before being diluted to finish the prescription. Still others have remarked on the relatively small amount of chlorine that is noted even when the last-named treatment is applied to the mixed chlorate and tincture.

Besides the mentioned additions to these prescriptions, diluted or full strength hydrochloric acid may be ordered as an ingredient.

The effect of different dilutions of hydrochloric acid on potassium chlorate will be dealt with in the course of this paper.

Any production of chlorine upon mixing just the potassium chlorate and tincture of ferric chloride will, of course, be due to the free acid contained in the tincture, which acid is derived from the solution of ferric chloride from which the tincture is prepared; for, as is well known, to keep these preparations clear by avoiding the formation of ferric oxychloride, the Pharmacopœia allows both of them to have an acid reaction. The ferric chloride as such does not enter into the reaction which liberates the chlorine.

The simplest expression of change that can be fancied as taking place between potassium chlorate and hydrochloric acid to give chlorine would be as follows:

$$KClO_3 + 6HCl = KCl + 6Cl + 3H_2O$$

But when potassium chlorate and hydrochloric acid actually react there is produced a yellowish gas known as "euchlorine," which is regarded as a mixture of free chlorine and chlorine dioxide; and its production is usually explained by the equation:

$$4KClO_3 + 12HCl = 4KCl + 6H_2O + 3ClO_2 + Cl_2$$

Whether one or the other of these equations is accepted, the chlorine potentiality is seen to be dependent upon the actual acidity, and consequently the amount of chlorine that can be produced depends upon the quantity of absolute hydrochloric acid in the materials which are mixed; for the chlorine of the chlorate is not available, but, as shown by the equations, remains combined with the potassium.

Again, if it is the pharmacist's intention to obtain as much as possible of any chlorine that may be liberated when the chlorate and tincture are brought together, the mixing will likely be done in an entirely dry bottle that is stoppered soon after

* Section on Practical Pharmacy and Dispensing, Portland, Me. meeting, 1928.

the introduction of the second ingredient; for experience has shown that if only a few drops of strong hydrochloric acid are put into a bottle that has just been rinsed, there may be but little or no generation of chlorine.

The N. F. V formula for **Liquor Chlori Compositus** will give some idea of the proportions of potassium chlorate and hydrochloric acid required, as also of the handling and diluting of these materials to produce a solution of sufficient chlorine strength to be recognized as of value. This solution shows 0.35% chlorine.

To determine what one is likely to get as chlorine or its compounds of like color, odor and effects, when potassium chlorate and tincture of ferric chloride are mixed, the following prescription was taken to three of Philadelphia's well-known dispensing pharmacies:

Potass. Chlorate	2 drs.
Tinct. Chloride Iron	2 drs.
Glycerin	2 drs.
Simple Syrup	4 drs.
Water enough to make	2 ozs.
Mix	
Label—dilute with water for use as gargle.	

There was also obtained from each store a specimen of its tincture of ferric chloride.

The question to be settled is—"Do these finished prescriptions contain free chlorine, and, if so, how much?"

There is no more delicate test for free chlorine than the starch and iodine test which occurs through the liberation of iodine when chlorine is brought into contact with potassium iodide; but, due to the fact that ferric salts themselves liberate iodine from potassium iodide, it was necessary to avoid contact of the tincture and the potassium iodide; and this was done by drawing any chlorine that was produced by the reacting materials out of the container in which the mixtures were made and into the potassium iodide solution.

For this purpose an aspirating apparatus was constructed as follows: an Erlenmeyer flask was provided with a tube to lead the air through a strong solution of potassium hydroxide (to absorb atmospheric chlorine) and with another tube leading into a flask filled with absorbent cotton (to trap any droplets of alkali which might be carried forward by the air current). This second flask was in turn connected with a third flask (the reacting flask) in which the materials to be examined were placed. It was connected with a side-tube fractionating flask by leading a tube through mouth of same to bottom, using side tube as escape, so as to trap alcohol, water or other liquid which might be carried forward. To the side tube of this fourth flask there was connected another Erlenmeyer flask in which was put a solution of potassium iodide mixed with starch paste (test flask), and from this fifth flask a rubber tube led to a suction pump.

All of the experiments recorded herein were made in this apparatus; each time before the apparatus was used for another experiment it was thoroughly cleansed and tested for several minutes by drawing air through it to prove the absence of chlorine.

This apparatus ready, each of the three prescriptions was examined within eight hours of the time that it was compounded.

The bottle containing the prescription, unopened until now, was well shaken and one fluidounce poured into the reacting flask, all connections having previously been shown to be tight, and suction applied.

Air drawn through the cold prescriptions for five minutes showed no effect on the test flask, thus proving the absence of chlorine gas. When, however, the reacting flask was placed in boiling water, the test flask soon showed the presence of chlorine, but only in very small amount as indicated by the fact that the contents of the test flask, upon prolonged application of heat, required only 0.15 cc., 0.1 cc. and 0.1 cc. of $N/10$ $Na_2S_2O_3$ (Sodium Thiosulphate) to discharge the blue color produced by the iodine and starch, for the three prescriptions in the order in whch they were handled.

When it is remembered that 1 cc. of $N/10$ $Na_2S_2O_3$ is the equivalent of 0.003546 Gm. of Cl, the very minute amount of chlorine possible of production by heating the finished prescription will be appreciated.

These quantities figured into percentage of prescription would be 0.00177%, 0.00118% and 0.00118%.

Some further idea of this amount of chlorine may be gathered by noting that the National Formulary states for its chlorine water a strength of 0.35 Gm. of chlorine in 100 cc. of the product, or 0.35%; which makes these prescriptions capable of yielding but $^1/_{300}$ to $^1/_{200}$ of the chlorine strength of the N. F. V chlorine water, when so treated.

Next there arises the question whether, on standing, such prescriptions develop chlorine. To learn about these, 11 days after they had been compounded and examined as above outlined, the other half or one fluidounce of each of the three prescriptions (which during this time had remained in the securely stoppered bottle) was well shaken and placed in the reacting flask of the apparatus. Five minutes' aspiration in the cold showed no chlorine in any of these prescriptions; but upon the application of boiling water to the reacting flask there was obtained exactly the same amount of chlorine as the freshly compounded prescription had shown.

These results show conclusively that there is no chlorine generated in such mixtures when made without heat, either at once or upon reasonable standing.

In order to learn what happens in the way of liberation of chlorine when potassium chlorate and tincture of ferric chloride are mixed, several experiments were made using 1 drachm of potassium chlorate and 1 fluiddrachm of the tinctures of ferric chloride purchased at the stores where the prescriptions had been compounded.

No chlorine was found to result from the mixing of chlorate with these three lots of the tincture, until the reacting flask was set in the boiling water, when chlorine was promptly developed by all of them and in abundance.

By prolonging the application of heat through immersion in boiling water until chlorine was no longer produced, and drawing all of it over into the potassium iodide solution, the three lots of the tincture yielded chlorine in equivalence of $N/10$ $Na_2S_2O_3$ as follows: No. 1, 49.3 cc.; No. 2, 50.8 cc.; No. 3, 47.8 cc. or 329, 508 and 478 times as much as was produced in a portion of the corresponding prescription equivalent to the fluiddrachm of tincture used.

All of these results taken together plainly show that the three pharmacies

from which the prescriptions were purchased make no special effort to see that the mixture generates chlorine. The results also show that the degree of dilution of the active acidity as well as its total amount is a factor to be reckoned with in mixing potassium chlorate and tincture of ferric chloride when the production of chlorine is intended.

In these experiments with the potassium chlorate and the tincture, by the time the liberation of chlorine had been completed, the contents of the reacting flask were found to have dried to a powder. These powders were not completely soluble in water, hot or cold, because of the formation of iron oxychloride or of hydrated oxide of iron, a condition which indicated the complete or nearly complete consumption of all free hydrochloric acid. However, the soluble portions imparted strong acidity to their water solutions, and when the turbid liquids were filtered, solutions colored golden-yellow by the ferric chloride were obtained.

It having been found that chlorine can be generated in the bottle by heating the mixture of potassium chlorate and tincture of ferric chloride by immersion in hot water, it was decided to learn whether the relative size of the bottle would make a difference in the amount of chlorine that will be liberated in the container and thereafter taken into solution by the liquid to be used for the dilution of the prescription in adjusting its final volume.

Accordingly, three lots (corresponding to the prescription) of a mixture of 2 drachms of chlorate and 2 fluiddrachms of tincture were placed in dry 2-ounce, 4-ounce and 8-ounce bottles which were provided with sound corks. These bottles were placed in a vessel of water and this brought to boiling while the stoppers were held in the mouths of the bottles by covering them with the hand. Finally, because of pressure of alcohol vapor in the bottle more than of any pressure of chlorine gas, the stoppers were ready to "blow," and some did. But unblown representative bottles were taken from the hot bath and to their contents cold water was added in portions of about four fluiddrachms at a time, with vigorous shaking, the bottle being kept stoppered between additions of water.

The contents of each bottle were brought to two fluidounces, and the resulting mixtures were examined for chlorine by placing one fluidounce in the reacting flask and drawing the chlorine into the test flask as usual.

The results were close to the following figures in $N/10$ $Na_2S_2O_3$: from the 2-ounce bottle, 0.19 cc.; from 4-ounce bottle, 0.27 cc. and from 8-ounce bottle, 0.5 cc. All of these mixtures had distinct odors of chlorine.

When the same quantities of chlorate and tincture were mixed cold and diluted to the same volume (two fluidounces) and one fluidounce of it then heated in boiling water (with less danger), they showed a production of chlorine equivalent to 0.15 cc. $N/10$ $Na_2S_2O_3$; which approximated the amount of chlorine obtained in a 2-ounce bottle by the more dangerous method of heating the chlorate and tincture before dilution.

It is very evident that there is opportunity for loss of considerable chlorine when the chlorate and tincture mixture, after heating, is being diluted with water, as the chlorine gas easily passes out of the bottle as the water is put into the container. It is also interesting to note that the N. F. V exacts but about one-half of the chlorine theoretically obtainable from the hydrochloric acid used in the preparation of **Liquor Chlori Compositus.**

To check up on the materials used, continued aspiration of air made through several specimens of tincture of ferric chloride with or without heat did not lead to liberation of iodine in the test flask, a result that clearly shows the absence of chlorine or similarly reacting gases in the tincture.

When cold official hydrochloric acid (31–33%) was treated in the same way it did not color the test liquid, but when placed in boiling water it brought about a slight purplish tint in the test flask.

Next, to determine the approximate strength of the weakest dilution of hydrochloric acid which will react with potassium chlorate at room temperature with liberation of gas that passed into potassium iodide solution will give a blue color with starch, a series of dilutions of official hydrochloric acid were made as follows: 10%, 5%, 2.5%, 1%, 0.5%, 0.375%, 0.25%, 0.1% and 0.01% of actual HCl.

These dilutions were tried with powdered potassium chlorate in the proportion of one drachm of the chlorate and one fluiddrachm of the diluted acid.

The three weakest dilutions showed no reaction with the chlorate either in the cold or when heat was applied to the reacting flask as described.

The next three dilutions 0.375%, 0.5% and 1% showed no effect in the cold, but when the reacting flask was set in boiling water all promptly showed a steady liberation of chlorine, and the stronger the acid the quicker this effect was seen.

Further experimentation showed that 2.5% hydrochloric acid is about the weakest dilution of this acid that will generate chlorine from potassium chlorate at room temperature; and although there was distinct odor of chlorine in the reacting flask but little color of the gas was observable as resulting from the use of acid of this strength.

When 5% hydrochloric acid was added to the chlorate, chlorine was immediately generated as shown by the test flask, and upon application of hot water to reacting flask, both it and the trap flask beyond showed plenty of the yellowish green gas.

A 10% hydrochloric acid, which is the official diluted acid, instantly liberated enough chlorine to show in the test flask, although but little color was noted in the reacting flask until the boiling water-bath was applied, when the reacting and next flask showed an abundance of chlorine gas. The N. F. directs hydrochloric acid diluted with an equal volume of water (equivalent to about 15% acid) for action on the chlorate with aid of water-bath temperature in making of **Liquor Chlori Compositus.**

Results thus far having indicated that the production of chlorine depends upon the amount of hydrochloric acid present and the degree of its concentration, it was decided to try a mixture of one drachm of potassium chlorate and 0.35 fluid drachm of the official solution of iron chloride, or the amount of this solution contained in one fluiddrachm of the tincture.

This mixture gave chlorine at once in the cold (showing an acidity equal to at least 2.5% of absolute hydrochloric acid) and on continued subjection to the heat of boiling water showed a total chlorine production that checked closely with the amounts produced by the one-drachm lots of the several tinctures.

When tincture of ferric chloride was replaced with the N. F. Tincture of Citrochloride of Iron which has the same ferric chloride content (but in which the free acid is neutralized by treatment with an excess of sodium citrate, with consequent

liberation of citric acid) there was no chlorine developed either in the cold or upon application of heat.

Nor did a mixture of one drachm of potassium chlorate and two drachms of citric acid in the presence of two fluiddrachms of water show any liberation of chlorine in the cold, and but a very slight discoloration of the test flask on prolonged heating of the reacting flask (perhaps due to trace of mineral acid in the citric acid).

Tartaric acid acted in the same way, likely for the same reason.

When a mixture of one drachm potassium chlorate and four drachms of powdered alum and two fluiddrachms of water were treated no chlorine was generated either in cold or by heat.

A mixture of one drachm of potassium chlorate and two fluiddrachms of U. S. P. Acetic Acid (36%) did not generate chlorine under either temperature.

The presence of glycerin seemed to make no difference with the reaction of the chlorate and tincture in the cold; but when the application of boiling water was continued until the alcohol of the tincture had distilled over, a violent reaction occurred in the reacting flask, the contents taking fire and developing back pressure. But fortunately no such reaction is likely to be encountered in the ordinary compounding of this prescription.

A mixture of sodium chlorate one drachm and one fluiddrachm of tincture of ferric chloride promptly showed development of chlorine in cold equivalent to 0.1 cc. of $N/10$ $Na_2S_2O_3$, and upon the application of heat about the same amount was shown with this tincture and potassium chlorate.

Hydrochloric acid of 2.5% strength acid was also found to be the weakest dilution that decomposed sodium chlorate in the cold.

CONCLUSIONS.

The mixing of potassium chlorate and tincture of ferric chloride without application of heat does not produce chlorine, either at once or upon standing.

The momentary heating together of these ingredients, as for instance in the bottle in which the prescription is to be dispensed, produces some chlorine, the stated amounts yielding perhaps a maximum of one-sixtieth to one-fortieth of the 0.35% of chlorine contained in the chlorine water of the N. F. V.

Regardless of what the prescriber may intend, it will be seen that but little chlorine can be produced, unless the chlorate is first acted upon by a sufficiently strong hydrochloric acid.

Should a physician express himself as expecting chlorine to be dispensed in mixtures of potassium chlorate and tincture ferric chloride, attention may be directed to the fact that but little of it is actually procurable from these ingredients; and that, to provide chlorine in amount comparable to the strength of the N. F. V chlorine water, hydrochloric acid must be included as an ingredient.

The proportions of chlorate and acid prescribed by the N. F. V for its chlorine water will serve as a guide when such considerable amounts of chlorine are wanted.

See your Railroad Agent for attractive rates and routes to Rapid City, South Dakota, the A. PH. A. Convention City—Week of August 26th.

OBSERVATIONS ON THE U. S. P. X TEST FOR "FOREIGN GUMS" IN TRAGACANTH.

BY R. A. KONNERTH.

The test for "foreign gums" in Tragacanth was introduced in the U. S. P. IX and carried over in the U. S. P. X. This test was applied to numerous samples of whole and powdered Tragacanth during this period with satisfactory results. Since February 1928, however, practically no Tragacanth could be found that would comply with this test.

During the week of August 13, 1928, the following observations were presented to the Plant Science Seminar held at Boston, Mass. They are herewith repeated for the purpose of further discussion and proper revision of the test by the U. S. P. Revision Committee.

In the test given on page 408 of the U. S. P. X, under "Tests for Identity and Purity" of Tragacanth, second paragraph intended for the detection of foreign gums, reads as follows:

> "Shake 2 Gm. of Tragacanth with 100 cc. of water until fully swollen and free from lumps, then add 2 Gm. of powdered sodium borate, and shake the mixture thoroughly until the salt is dissolved; the mucilage does not lose its transparency, nor exhibit any change in consistence, and on pouring is not slimy or stringy even after standing twenty-four hours (foreign gums)."

We found that when the powdered borax is added to the properly prepared mucilage and the mixture is shaken as directed until the borax is dissolved, a fairly firm jell forms within 10 to 30 minutes. This jell retains its consistency practically unchanged for more than 72 hours. Such a jell when formed in a 250 cc. Erlenmeyer flask cannot be dislodged even with violent shaking.

The gums tested represent very clean, white and perfect A-1 ribbons, complying with all other U. S. P. tests. The poorer grades on the market also fail to stand the U. S. P. test for foreign gums.

The writer believes that the market is flooded with one or more of the Asiatic species of Astragalus (Fam. *Leguminosæ*), which do not stand the U. S. P. test for "foreign gums."

It would seem desirable that this test be either revised or eliminated.

ANALYTICAL LABORATORIES,
E. R. SQUIBB & SONS.

SPECIFIC GRAVITIES OF FIVE OFFICIAL SYRUPS.*

BY W. G. CROCKETT AND L. E. JARRETT.

The work represented in this paper was undertaken with two objects in view (1) to facilitate grading our students upon syrups they prepare in the laboratory, (2) to help establish official specific gravities for these syrups in case this be deemed wise by the committee for revising the Pharmacopœia.

Experience teaches us that frequently students are more concerned about finishing preparations rapidly and getting credit for the work than they are about

* Section on Practical Pharmacy and Dispensing, A. PH. A., Portland meeting, 1928.

the quality of finished products. Since sugar dissolves slowly in the cold, students sometimes attempt to hurry these preparations along either by using less sugar than is required or by straining before it has dissolved completely. If the specific gravity of the finished product be known, the teacher can reject immediately those syrups which are deficient in sugar, by using an hydrometer.

The syrups which serve as the basis for our work were prepared by our students during their laboratory course in galenical pharmacy and in accordance with the official methods. The class was advised in advance that some of their products would be used for experimental purposes and was requested to exercise the usual precautions. Forty samples of each syrup were prepared, from which twenty samples were chosen at random for specific gravity determinations.

This procedure furnished us with twenty samples of each syrup, made by twenty different manipulators, and under conditions which pretty nearly approximate those prevailing in the drug store. All weighings were made in a 25-cc. alcohol pycnometer at exactly 25 degrees centigrade. Conditions were altered in some cases as will be noted below. Weighings were made to the fourth decimal place although gravities have been calculated to the third place only.

Weight of pycnometer filled with water at 25° C. 62.0334 Gm. Weight of pycnometer alone 34.6256 Gm. Weight of water required to fill pycnometer 27.4078 Gm. This weight, 27.4078 Gm., is used in calculating all gravities in the tables.

SYRUP OF WILD CHERRY.

Syrups 1 and 2 were prepared from coarse powders purchased during the summers of 1926 and 1927, respectively. Each student prepared 200 cc. of the syrup, percolating onto the sugar contained in an 8-ounce prescription bottle and adjusting the final volume to a scratch he had made upon the bottle after pouring 200 cc. of water into it.

TABLE I.

Student number.	Syrup number.	Weight of syrup used.	Specific gravity.	Student number.	Syrup number.	Weight of syrup used.	Specific gravity.
3	1	35.7280	1.303	7	2	35.6550	1.301
13	1	35.8426	1.307	9	2	35.8246	1.307
11	1	35.9320	1.310	12	2	35.9446	1.311
15	1	35.9520	1.311	1	2	36.0775	1.316
2	1	35.9706	1.312	14	2	36.0942	1.316
10	1	35.9940	1.313	20	2	36.1196	1.317
4	1	36.0506	1.315	19	2	36.2432	1.322
6	1	36.1584	1.319	5	2	36.2454	1.322
16	1	36.1622	1.319	8	2	36.2928	1.324
17	1	36.1884	1.320	18	2	36.4720	1.330

The specific gravity of 1000 cc. of syrup of wild cherry prepared by a member of our faculty and in accordance with the official process, was found to be 1.317.

SYRUP OF ORANGE.

Syrups 1 and 2 were made from two freshly prepared tinctures of sweet orange peel. Each student prepared 100 cc. in a 4-ounce prescription bottle, adjusting to final volume as in the case of wild cherry.

TABLE II.

Student number.	Syrup number.	Weight of syrup used.	Specific gravity.	Student number.	Syrup number.	Weight of syrup used.	Specific gravity.
17	1	34.7292	1.267	14	2	35.1794	1.283
6	1	35.4280	1.292	19	2	35.1086	1.281
18	1	35.6916	1.302	2	2	35.4550	1.293
4	1	35.7836	1.305	1	2	35.5023	1.295
7	1	35.8422	1.307	9	2	35.6008	1.298
3	1	35.9820	1.312	15	2	35.4894	1.295
16	1	35.9730	1.312	5	2	35.6896	1.302
20	1	35.9810	1.312	11	2	36.0422	1.314
10	1	36.0564	1.315	12	2	36.0184	1.314
8	1	36.0982	1.317	13	2	36.0916	1.316

SYRUP OF TOLU.

Each student prepared 100 cc., warming to dissolve the sugar and making up to volume as before.

TABLE III.

Student number.	Weight of syrup used.	Specific gravity.	Student number.	Weight of syrup used.	Specific gravity.
16	34.2622	1.250	9	35.1902	1.283
8	34.4748	1.257	14	35.1686	1.283
13	34.4982	1.259	19	35.1626	1.283
7	34.6297	1.263	2	35.1871	1.283
11	34.7562	1.268	4	35.1854	1.283
20	34.8550	1.271	18	35.1755	1.283
6	34.8698	1.272	17	35.2880	1.288
10	34.8708	1.272	3	35.3222	1.289
12	34.8904	1.273	1	35.5064	1.295
5	34.9683	1.275	15	35.6264	1.300

SYRUP OF GINGER.

In preparing syrups 1 and 2, fluidextracts made by Sharp and Dohme and Eli Lilly, respectively, were used. Each student prepared 100 cc., warming to dissolve the sugar and making up to volume in a 100-cc. measuring cylinder.

TABLE IV.

Student number.	Syrup number.	Weight of syrup used.	Specific gravity.	Student number.	Syrup number.	Weight of syrup used.	Specific gravity.
12	1	34.3294	1.252	9	2	34.5756	1.261
11	1	34.6552	1.264	3	2	34.6382	1.263
15	1	34.6535	1.264	5	2	34.7948	1.269
20	1	34.7404	1.267	4	2	34.8956	1.273
17	1	34.8234	1.270	6	2	34.9482	1.275
18	1	34.9024	1.273	10	2	34.9610	1.275
19	1	34.9490	1.275	7	2	34.9928	1.276
13	1	35.0614	1.279	1	2	35.0156	1.277
16	1	35.1457	1.282	2	2	35.1360	1.282
14	1	36.0082	1.313	8	2	35.2452	1.286

After the work above had been completed three 100-cc. samples of syrup of ginger were prepared by a member of our faculty, using S. & D. fluidextract of ginger and making up to volume in a 100-cc. cylinder. Their gravities were found to be 1.281, 1.284 and 1.290.

SYRUP OF CITRIC ACID.

Several liters of plain syrup were first prepared by percolation and this product was used in the manufacture of all syrups in the table below. Each student prepared 100 cc. syrup of citric acid, making up to volume in a 4-ounce prescription bottle as described previously.

TABLE V.

Student number.	Weight of syrup used.	Specific gravity.	Student number.	Weight of syrup used.	Specific gravity.
3	34.8546	1.271	5	35.5546	1.297
10	34.6126	1.262	4	35.5870	1.298
17	35.1548	1.282	7	35.6226	1.299
2	35.3574	1.289	11	35.4452	1.293
13	35.4584	1.293	12	35.5196	1.296
6	35.4392	1.293	15	35.6250	1.299
8	35.4656	1.293	16	35.6406	1.300
20	35.4590	1.293	19	35.6384	1.300
9	35.5122	1.295	18	35.7094	1.302
14	35.5474	1.295	1	35.8196	1.307

The variations in the specific gravities of this syrup are greater than we had anticipated, since all students were using from the same sample of plain syrup. Three 100-cc. samples of syrup of citric acid were prepared at a later date by a member of our faculty, who used a plain syrup having a specific gravity of 1.308 and made them up to volume in a 100-cc. cylinder. The specific gravities of these three samples were found to be 1.302, 1.302 and 1.303.

SCHOOL OF PHARMACY,
MEDICAL COLLEGE OF VIRGINIA,
RICHMOND, VA.

PHARMACEUTICAL MANUFACTURING AND ITS RELATIONSHIP TO THE DRUG STORE.*

BY EDWARD D. DAVY.[1]

Increasing the professional standing of the pharmacist in the community is of unquestionable interest to the pharmacist, pharmaceutical organizations and schools; but the manner of accomplishing it without additional fundamental training is a very difficult problem.

It is intended here to present one phase, largely discarded, but which I believe will help the cause, and that phase is manufacturing on a small scale in the drug store.

The reasons ordinarily offered for not continuing the old practice of making some of these commonly used products is lack of time; the lack of time being largely occasioned by customers for hair nets, toys, post cards, sandwiches, etc.

Ordinarily, if the stock above mentioned does not obtain in the drug store, considerable time is available, which one man could give to the manufacture of certain preparations which do not require elaborate apparatus.

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* Section on Practical Pharmacy and Dispensing, A. PH. A., Portland meeting, 1928.

[1] Western Reserve University, School of Pharmacy.

The pharmacist should present to the medical profession, as occasion warrants, the many official preparations which are obtainable for his use, and also the possibility of preparing special formulas, if desired, many of which may be for experimental purposes only. The common practice of quietly passing out proprietary or semi-proprietary preparations on prescription or at retail should be discouraged.

Many special formulas and test solutions are of necessity needed, and it is chiefly in the hospital that the physician learns the practical application of these. When he goes into private practice he is immediately confronted with the ready-to-use products which, later, leads to their almost constant use and office dispensing.

The idea of individuality in pharmacy must be brought about by the combined initiative of employer and employee, and certainly no better way can be found than by properly presenting to the physician and public some preparations, with the contents and manufacture of which the management is thoroughly conversant.

A great number of special formulas require considerable thought, if a presentable product is made, and the technique used in making them can readily be taught in our schools of pharmacy with very moderate equipment.

Many pharmacists are truly professional men and command the respect that is justly theirs; too many have become merely purveyors of commodities, yet expect to be removed from the tradesman class.

The responsibility rests with the pharmacists and the schools training them, to see the need for individuality in pharmaceutical endeavor. I have often asked of the retailer, "Why do you not make certain preparations?" The reply is, "I can buy them cheaper than I can make them." A glance at the price list of crude materials for a given preparation soon shows the fallacy of such an argument. The total cost of crude materials is usually from one-fifth to one-fourth that of the list on the finished product, and the pharmacist usually has the crude materials at hand for his limited prescription work. The difference in cost of materials and the list on the product represents a little work.

If the pharmacist values his time according to one advertisement which recently appeared, purporting to show how the pharmacist could save money by buying this particular product instead of making it, in which his services were allowed for at the rate of 61.5 cents per hour, then it is the more imperative that he use his brain, pencil and muscle to increase his wage scale.

It would be futile to advocate the preparation of tablets, products requiring assay, or products with high alcohol content; but there still remain many preparations requiring the mortar and pestle, percolator and pill tile, which should not be forgotten.

An added advantage in manufacturing experience may be gained through familiarity by contact with these preparations. Taking tablet manufacture as a concrete example, few stores will have sufficient demand for tablets to warrant their manufacture, but a study of the details of granulating the various materials, either singly or combined, lubricants, coloring, disintegration, types of machines, etc., places the purchaser in a position to know what and how to purchase and enables him to answer questions concerning tablets or other preparations which he probably dispenses every day.

If you will pardon the reference to our manufacturing laboratory in connection with the school, I should like to add that, as a result of our direct relationship

with the hospitals, a better understanding is brought about among the pharmacists and the medical men and a great deal more work is being turned over to the pharmacy of the hospital, aside from that which the school is doing. In addition, the physician, who has had hospital training under these conditions, when going into private practice, looks to the pharmacist to supply his needs. As a result, we have numerous queries from local pharmacists concerning formulas, which is, I believe, proof that the pharmacist, even in a limited way, may develop a better understanding with the medical profession and the public by showing originality along some strictly pharmaceutical lines. Eventually, two types of stores will probably be evolved—the pharmacy and the drug store.

FOLLOWING THE LEADER.*

BY ROBERT P. FISCHELIS.

Merchandising experts advocate, as one method of drawing trade, concentration from time to time on a single item or group of items which can be offered at attractive prices or in company with some special service feature. Such items or group of items are designated as "leaders."

It is not difficult to attract customers when the "leader" is a standard product offered at a greatly reduced price. It is more difficult to attract trade when the "leader" is an unknown product, even though its price is low in comparison with standard products of a similar character.

It may be still more difficult to bring customers into a store when the leader is a special product made in the store or a new form of service, although there is room for a difference of opinion here. There would doubtless be a sufficient number of specific instances available to prove the case either way.

What is the real test of the success of the plan to concentrate public attention on the "leader?" Undoubtedly the answer is "the number of followers." If the "leader" is not followed by an ever growing number of permanent customers it is largely a failure.

Every retail pharmacist can doubtless point to some items in his stock or to some service rendered by his organization which causes people to return to him for that item or that service and incidentally for other things. These are his "leaders" whether he recognizes them as such or not. If he keeps proper records he will recognize them and eventually capitalize them.

The object of this paper is to point to one "leader" that will insure a following greater than is possible with any other. I refer to prescriptions and I desire to cite only one incident of recent occurrence which gives indisputable evidence of the great power of Prescription Compounding as a "leader" for any retail pharmacy.

An establishment in one of the larger Eastern cities has had a slogan emphasizing prescription work for years. It never was a strictly prescription store but took full advantage of its transient location to build up a general drug and sundry business, with soda fountain, etc. It recently filled its two millionth prescription. A year or two ago this establishment was compelled to seek new quarters because of a demand from its landlord of an increase in rent amounting to five times what

* Section on Commercial Interests, A. PH. A., Portland meeting, 1928.

was being paid. There was no other location nearby and it was necessary to move a considerable distance from the original location. The new location was "clocked" and it was found that only three-fifths of the number of people who pass the old location during a given period, pass the new location, and inasmuch as the main thoroughfare of the city intervenes between the two locations it was safe to assume that a large percentage of the people customarily passing the old location on their way to and from business would not pass the new location. In other words, it was to be expected that business in the new location would hardly be more than 50% to 60% of what was done in the old location.

A sufficient period for readjustments has elapsed and I have been informed that the drop in general business was nearer 25% than 50% and in the prescription business it was actually less than 25%. The leader—namely prescriptions—had developed a sufficient following over a period of years to continue to attract people to the new location even though in terms of modern transportation and convenience the location may be described as inconvenient. The management attributes its success to the character of its "leader" and no one will doubt that not a single other product or service that might have been selected as a "leader" for this particular store could have accomplished what emphasis on prescription service and the building of a clientele on this basis has apparently done. Surely there is a moral in this which will not escape even the most extreme merchandising enthusiast in pharmacy.

THE TEACHING OF COMMERCIAL PHARMACY AND ITS RELATION TO SCIENTIFIC OR PROFESSIONAL PHARMACY.*

BY C. E. MOLLETT.

During the last half century, due largely to the economics of quantity production by large manufacturing concerns, and partly to increased facilities for transportation, the retail pharmacist has become more of a distributor than a manufacturer but, fortunately, he is still a dispenser and an adviser of the public on questions of health and medicine.

Retail pharmacy furnishes an immediate opportunity for the services of the graduate, therefore many schools have overlooked the opportunity to even train for other fields. The inadequate two-year schedule of the past was so crowded with skeleton courses which could not be taught like other sciences that it forced schools to forgo the addition of subjects beyond the mere fundamentals of ultra-scientific pharmacy. This, fortunately, is being overcome at present by the lengthening of the minimum course.

Since retail pharmacy is so largely concerned in the distribution of products furnished by a great unseen corps of researchers in many laboratories, it is important that teachers of the science study the new and changed conditions in order to function properly and train the young pharmacists to meet these new conditions, lest thousands of these unseen workers be unable to gain a livelihood, and the public suffer for want of their services.

Let it be understood that the sale of commodities, not pharmaceutical or in some way related, is not commercial pharmacy, but pure merchandising. While

* Section on Commercial Interests, A. PH. A., Portland meeting, 1928.

those who love the profession deplore the entrance of the lunch counter and the sale of all kinds of unrelated commodities in the drug store, it must not be forgotten that many pharmacies owe a debt to merchandise lines, which have helped pharmacists during the past decades to maintain respectable and high class pharmacies which otherwise would have been forced to close their doors, and thereby deprive many localities of the helpful services of a good pharmacist.

It might be well here to raise the question as to what is commercial pharmacy. An author of a well-known text on this subject gives the following definition: "Commercial pharmacy is that science that treats of the proper methods of buying and selling of commodities as a business of pharmacy, and for profit." This does not clearly define or give a distinction between commodities related or unrelated to medical science. Another author of a more recent publication, entitled, "Drug Store Business Methods," diplomatically avoids the use of the term "commercial" pharmacy altogether, but rightly assumes that good business methods are essential to the operation of an efficient pharmacy.

There has been a great change in the last quarter of a century. The old adage, "that if you can make the best rat trap, the world will make a beaten path to your door," is much out of date. No matter how well trained, no matter how skilled you are, no matter how fine your product may be, you cannot make a success unless you can find the one who needs your services, or to whom you may sell your product.

The increasing competition in the sale of medicinal products by all kinds of stores demands better drug store business methods on the part of the pharmacist, if this competition is to be met successfully. Proper laws may assist, but can do little good as compared with a super-knowledge of pharmacy and the practice of better business methods by the pharmacist. All professions to-day, such as medicine, dentistry, etc., have courses similar in nature to our so-called commercial pharmacy courses, designed to prepare their followers in meeting the public, collecting their fees and selling their services. Therefore, a course in the efficient management of the drug store is a necessity and should be included in every pharmaceutical curriculum and taught by a pharmacist who has had actual experience in this line of work.

A few schools have mildly attacked this subject for more than a quarter of a century, but in most instances have been afraid to "go all the way." In 1904, the speaker was privileged to pursue a course in dispensing and prescription practice in the model drug store laboratory of The School of Pharmacy of Kansas University, under the late Dean L. E. Sayre. This laboratory was arranged on a well-thought-out plan of an eighteenth century scientific pharmacy. There were no show cases and no druggists' sundries; nothing but crude drugs, chemicals, dispensing apparatus and shop bottles filled with galenicals. Compare this, if you please, with the modern laboratories, or so-called model drug stores of the Oregon Agricultural College School of Pharmacy, and of the University of Washington School of Pharmacy, where not only the dispensing of prescriptions is exemplified, but also the arrangement and display of drugs, drug sundries and all kinds of medicinal products, which are used in training the student for the duties of a retail drug clerk.

The best synonym for salesmanship to-day is service, and in pharmacy it is requiring a better knowledge of all medicines, appliances and commodities which are purchased and sold and used to assist in the prevention and alleviation of disease

and the promotion of health and happiness of the patrons of this ancient science, which is the foundation of all therapeutic medicine.

It behooves pharmacy schools to add more and better courses and separate curriculums for the other phases or fields of pharmacy as well as for the education of the retail pharmacist. It has been said that retail pharmacy to-day occupies the highest pinnacle of success in its history.

Some believe the chief fault lies in the fact that there is not enough pharmacy taught to-day. There is more than enough foundation subject required in most schools for the superstructure of pharmacy which is builded thereon. Too many of the teachers are chemists instead of being pharmaceutical chemists; too many of the teachers are botanists or biologists instead of being pharmaceutical botanists or biologists.

In the minds of some of us who have spent the greater part of our years in preparing students for this profession, the chief need of pharmacy is more and better courses, longer and broader courses, as well as additional cultural studies.

It is not necessary, however, for pharmacy schools in state universities, which maintain business administration departments, to add any business courses other than those that deal directly with pharmacy. Trade courses are entirely unwarranted.

The decline in the dispensing of prescriptions, and the unpopularity of this department with some retail pharmacists is said to be due largely to the lack of good business methods.[1] A large number of stores have operated this department at a decided loss in profits, and many are still doing so to-day. This, too, in many cases has compelled the pharmacist to add more sundries and merchandise lines in order to maintain this division.

Commercial pharmacy is therefore necessary in the efficient conduct of a retail or of a prescription pharmacy and its foundation is the sum total of the knowledge of the science which must be used in accord with modern business methods strictly applied to pharmacy.

SOME OBSERVATION ON PACKAGED HOUSEHOLD DRUGS.*

BY B. F. DAUBERT.

Packaged household drugs consist of such items as epsom salt, sulphur, turmeric, alum, Rochelle salt and a host of others packed in 1-oz., 2-oz. and 4-oz. packages and larger. Most of these items that are commonly used in the household are sold in all drug stores. It is a debatable question whether it is an advantage to the druggist to dispense these items already conveniently packed, or whether it is detrimental to his profession and business. On observation it is conceded, without doubt, that placing drugs in conveniently sized packages increases and aids in the speed and rapidity of sale. It decreases the amount of time necessary to make such a sale, an important factor in modern merchandizing. There is an air

[1] EDITOR'S NOTE: Recently, several successful retailers have discontinued the "Modern Store" methods and are now conducting pharmacies with very satisfactory results. Probably one of the greatest modern successes in Europe has been the Pharmacie Principale of the Toledo brothers in Geneva. In this store professional and business methods are practiced.

* Section on Commercial Interests, A. PH. A., Portland meeting, 1928.

of neatness and cleanliness about an item sold in packages which brings forcibly to our attention that the public selects those things that are neat and clean. There is a psychological factor present in that it gives the young apprentice a smug feeling which inspires a confidence in the drugs he dispenses. The sale of packaged household goods is a distinct advantage to the druggist, because he is able to satisfy the demands of the public. Service and quality are very essential for satisfying the public. Dispensing of packaged goods bought and sold, as such, by the druggist must not be confused with drugs that are purchased in bulk and packed by the druggist. He who buys bulk drugs and dispenses them in small cartons is carrying out some of the many essentials of his profession, coupled with convenience. Druggists who buy packaged drugs and dispense them in the same cartons in which they are purchased are placing themselves on the same plane with the unskilled clerks in wholesale and retail groceries. On further observation, I sometimes wonder if the sale of such well-known drug store items does not decrease that professionalism which we should strive to maintain. We, who are professional men and women, seem too ready to sever one of the remaining threads which tie us to the demands of our profession. We no longer encounter that fragrant aroma of cloves, spices and other odorous drugs that were once synonymous with the drug store.

The sale of packaged goods does not require the services of a professional druggist nor that of one skilled in the handling of common drugs; druggists do not have the monopoly of such sales, as the items are distributed among confectioners and grocers. The effect that sale of packaged goods will have on the future pharmacist is one of grave concern. It will lessen his respect for the profession; he will be of the belief that he knows all there is to be known about the intricacies of the profession, whereas in reality he will not be able to identify the items sold in packages. It will produce a carelessness within him which will be difficult to overcome. The respect due the pharmacists of the past will be singularly absent, because spices, roots and herbs will have no place in the thoughts of the new pharmacists.

TANNIC ACID TREATMENT FOR BURNS AND SCALDS.

The high mortality among children from burns and scalds is not due to primary shock, but is caused by the onset of the toxæmic stage. In the treatment of these casualties the pre-requisites are: Prevention of absorption from the injured tissues, prevention of local sepsis, painless dressing or covering for the burned area and rapid healing with a minimum of scar formation. Tannic acid fulfils all these requirements, inasmuch as it produces a local coagulum over the raw surface and a practically waterproof and rigid covering over the denuded surface. Its actual application is painless and pain-relieving, and no further dressings are required once the formation of the coagulum is complete. In consequence of the coagulum formation, healing progresses undisturbed beneath the covering thus formed. The preparation used is 2–5 per cent of tannic acid in sterile water, freshly prepared for each application, and it is most convenient to keep 110-grain packages of the powder to be dissolved in half a pint of water when required. The scar formation is rapid and most satisfactory. Although patients require skilled nursing in order to ensure that bed-clothes, etc., do not touch the coagulum, nursing is greatly simplified because the patient is comfortable throughout, and so is rarely restless or irritable. The method is seldom applicable to cases which have been treated by any other methods longer than twelve hours earlier, and once toxæmia through absorption has set in, tannic acid is quite ineffective. Moreover, no coagulum will form after about twenty-four or thirty-six hours from the time the burn or scald has been received.—Gertrude Herzfeld, *Practitioner;* through *The Pharm. J. & Ph.* (March 2, 1929).

DEPARTMENT OF BUSINESS MANAGEMENT

Conducted by Paul C. Olsen.*

COMMENTS, QUESTIONS AND SUGGESTIONS ARE INVITED AND WELCOME.

Readers are invited to submit comments, criticisms and suggestions regarding the material which appears in this department. The Editor also will undertake to answer questions regarding general problems of business management. Letters of general interest will be published, but the writer's name will not be revealed without his permission.

DOES A MANUFACTURER'S VOLUME INCREASE WHEN RETAILERS CUT PRICES?

BY THE SALESMANAGER OF A NATIONALLY KNOWN PHARMACEUTICAL MANUFACTURER, AS TOLD TO PAUL C. OLSEN.

It is a fact that a great many manufacturers are only a little more than lukewarm on this subject of wholesale and retail price maintenance. If the truth were stated frankly their opinions would run somewhat as follows:

"Oh, yes, price maintenance," (with a gesture of impatience) "that's just a difficulty between two different classes of retailers. When one group starts to cut prices, I gain from these cutters what I lose from the others. In fact, the more of a cut price war there is, the greater the net gain I stand to make, because it is only common sense to presume the lower the price at which retailers choose to sell my product, the more of it there will be sold."

In college there was a professor of mine who, when he spoke before an audience of business men, immediately disarmed them by starting his speech with this sentence—"The trouble with the average business man is that he is too theoretical!"

The more I see of business men, as the years go by, the more I am inclined to believe that the old professor wasn't so far wrong at that. And one of the most potent reasons for this belief of mine is the condition that I have just described—the unreasoning, unsound belief that I have just described, which is held by many responsible manufacturers—that cut price wars of retail distributors in which their product is involved are no concern of theirs. In fact, such price wars are rather to be encouraged or at least tolerated, say these manufacturers, because they are believed to help build up that fetish of modern business practice—volume.

My contention is that these gentlemen are guilty of armchair theorizing which is far, far removed from the actual facts of the situation. We have just had an experience in Philadelphia which proves that—to our satisfaction at least.

We manufacture tooth paste and, as tooth paste is probably the most widely used toilet article, we have been trying for years to make it the leader of our line. The unfortunate side of the picture is that because of this widespread use of tooth paste, there probably is no item in the entire toilet goods field which is harder to get started or in which competition is more severe.

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However, we were in a much better position than most manufacturers who have wanted to enter the tooth paste field, because our name is one of the best and most favorably known in the pharmaceutical field and the mere attachment of this name to a tooth paste was sufficient to secure for it initial distribution, at least.

Moreover, because of our varied and favorably known line of pharmaceutical products and toilet articles, we had, already established, when we began our tooth paste campaign, the necessary contacts with the drug trade. In fact, in recent years, these contacts had been direct with practically every worth-while outlet in the retail drug trade, although we still sell also to jobbers at prices which permit them their usual profit. The importance of these direct contacts with the retail trade will be apparent in a minute.

When we were ready to enter Philadelphia our first step, therefore, was to try to place at least a small stock of our tooth paste in every store which, from previous contact and experience, was likely to prove a satisfactory distributor. As I explained, this was not especially difficult, because of the good will and reputation attached to our name. The real test would be the repeat business.

Simultaneously with this introductory distribution, newspaper advertising began to appear in liberal space in the Philadelphia papers as well as the usual magazine advertisements. In addition, we arranged for and readily obtained hundreds of window and counter displays all over the city.

This was easy because retail druggists were willing to coöperate with us. They knew they could safely put in one of our window displays and not find the very next day, to their chagrin, that a competitor down the street was offering the very same merchandise at cut prices. From the first, we have vigorously used every legal means to maintain prices on our products. Because of our direct distribution methods it is possible for us to exercise rather close control over our distributors by the simple expedient of refusing to sell those who do not conform to what we know to be fair retail prices for our products.

Our tooth paste sales increased steadily in Philadelphia under the combined influence of newspaper and magazine advertising, plus interested dealer coöperation and a product of proved merit which did repeat.

Then one week the sales curve suddenly flattened and became a horizontal line. Sales barely held their own. Armies of our scouts quickly descended on Philadelphia to learn the causes for our failure to maintain our usual sales increase. They soon uncovered the trouble.

The price we have always suggested for our tooth paste is 35 cents with a minimum price of three tubes for a dollar. A few weeks before, one salesman in Philadelphia had run across one druggist who had boldly marked his stock 29 cents. When we suggested to him that this price was bound to be unprofitable to him as well as unfair to us, he flatly refused to listen. So we immediately stopped filling his orders and thought our troubles with him would soon be over.

Unfortunately, however, this was only a beginning. This druggist had discovered a source of supply which was willing to sell him our tooth paste in virtually unlimited quantities. It wasn't long, of course, until other druggists, too, began to sell at the cut price and they also soon discovered this source of supply. Then, in an effort to outwit competitors, some stores dropped the price to 27 cents and 26 cents, and as low as four tubes for a dollar.

Here the armchair theorists who are ardent supporters of the laissez-faire policy in price maintenance will say, "Don't worry. Let them go to it. You will sell more of your tooth paste than ever before. If the retailers are foolish enough to throw away their profits, that's nothing for you to concern yourselves about."

If these theorists are right in their contention, our sales in Philadelphia should have kept right on going up after this price war started. In fact, if anything, they should have gone ahead even faster than before because of the impetus of the lower price. As I have said, however, we barely held our own.

Remember, our magazine advertising kept right on. Our newspaper space was the same as usual and the product of course was as good as ever. The only thing missing from the set of conditions which had brought us distribution and increasing sales could be druggists' window and counter displays of our product. Our scouts quickly discovered that these displays had disappeared practically overnight.

Almost as one man, the druggists who formerly had displayed our product reported as follows. "Certainly yours is a good product and we know those of our customers who have tried it like it, because it repeats regularly.

"But it's hopeless for us to try to push your tooth paste at the price at which you insist we sell it. We have arguments enough with regular buyers who come in and ask for it and then want to know why we don't sell for 27 or 29 cents like So and So down the street. Why should we multiply our troubles by trying to create more sales for a product which causes us enough trouble as it is?

"Of course we could meet these 27 and 29 cent prices by buying from the sources where those fellows get their merchandise, but if we do there's always someone who will undersell us. So why start an endless chain of cutting? We're sorry for you, but we simply can't afford to do anything to push the sale of your tooth paste."

Some people may wonder why we didn't get enough business from the cutters to more than make up for our losses in these other stores. A little common sense reasoning will answer that. The difference between 35 and 27 cents is just 8 cents. Now, I ask you, how far out of the way will a person go to save 8 cents—how far out of the way is he justified in going to save 8 cents? Of course what happened to us was that the cutters sold their regular trade plus a few competitors' customers within easy reach of their stores. The rest of the people in Philadelphia who did not have ready access to the comparatively few cutters simply read or heard about these cut prices and when they demanded them of druggists who were maintaining the price these druggists simply stopped boosting our product and sold it only to those who unmistakably asked for it.

Is this some theorizing on my part? Listen to this. We succeeded at last in stopping the source from which these cut rate druggists were getting our tooth paste after we had refused to sell to these druggists. Immediately, retail prices went back to their former fair and profitable level and, best of all, our tooth paste sales resumed their upward trend, because now druggists over the city were willing to get back of a product which they could sell continuously at a fair profit.

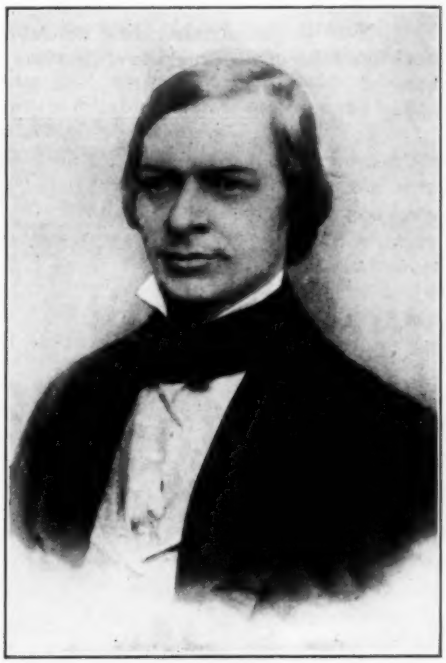
Don't let anyone ever try to tell me that retailers' cut price wars are no concern of the manufacturers. I know and I have the facts to back me up. Dealer coöperation very well may mean the difference between profitable and unprofitable volume, and dealer coöperation isn't to be obtained from any large group of retail merchants unless they are able to sell a product at a fair profit.

DRUG CLERKS ONE HUNDRED YEARS AGO.*

BY F. B. KILMER.

To be located in the same building for over one hundred years, to be in the possession of members of one family for nearly the whole century and to have never sold soda water, is the somewhat unusual story of a drug store in New Brunswick, N. J.

In the year 1827, Richard McDonald, a druggist, erected a building at the corner of Church and Peace Streets, in New Brunswick, and occupied the lower floor for a drug store, using the upper floor as living quarters for his family.



CHARLES D. DESHLER.

In this building, altered from time to time to meet the changing conditions, the trade in drugs is still "going strong." The founder, Richard McDonald, had his sons for partners, and in turn his son-in-law, R. G. Van Pelt. Through other changes the business descended to Edwin R. Van Pelt, grandson of the founder. Thus we have the grandfather, sons and grandson for nearly a century dispensing drugs from behind the same counter. The store, known as Van Pelt's Drug Store, passed out of the family in 1924.

A man who in after life achieved fame in literature as a critic and historical writer, Charles D. Deshler, was apprentice and clerk and at one time a partner in this now century-old drug store. He left behind a chronicle of his experiences as a drug clerk. Eliminating matters, local in character, Mr. Deshler's story is given here.

RECOLLECTIONS OF AN OLD TIME DRUG CLERK.

FROM THE WRITINGS OF CHARLES D. DESHLER.

When I entered upon my novitiate in the art and mystery of an Apothecary, the business was in a semi-transition state, and had almost entirely divorced itself from the sale of dry goods and groceries, which had formed an important branch of the business in the eighteenth century and in the early part of the nineteenth century. I speak more particularly of the business as it was conducted in New Brunswick, where I began my novitiate on September 1st, 1832.

I think I am quite safe in saying that the business as then conducted in New Brunswick was a favorable type of the business elsewhere in New Jersey; for New Brunswick was then one of the largest as well as one of the oldest cities in the State, and several of its druggists were considerably in advance of others in the State.

Although, as I have said, the business had divorced itself from two of its illegitimate affini-

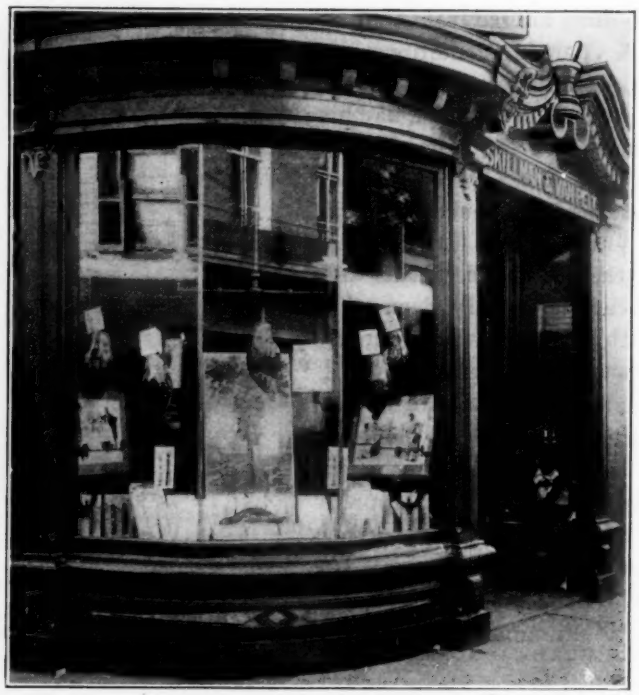
* Section on Historical Pharmacy, Portland meeting, 1928.

ties, it still retained, and indeed had greatly enlarged, its relations with others which were no less illegitimate than those which it had discarded, but still were not so absolutely incongruous as they were with the art and calling of an apothecary.

The New Brunswick druggists included in their stock of supplies such articles as paints, oils, dye-stuffs, varnishes, window glass, bakers', fullers' and hatters' articles, lime, sand, tar and ship-chandlery, snuff, spices, liquors, etc. I observe in passing that liquors were only sold by druggists by the bottle, or by the pint, quart or gallon. I never knew or heard of any having been sold by them to be drunk on the premises. Moreover, their sale was confined almost exclusively to wines and brandy. Whisky, rum and the like, were seldom sold by them.

A Druggist Is More Than a Merchant.

Notwithstanding that these unrelated branches constituted by far the larger part of the stock and sales of the druggists of that day, it was the apothecary department which chiefly oc-



The Old Apothecary Shop.

cupied their time and thoughts, and which gave their business the special distinction and consideration which it enjoyed in the popular estimation. The apothecary was then popularly rated as quasi-professional, perhaps because the art and mystery of his calling demanded a longer training and a higher intelligence for its mastery than that of any other mercantile pursuit, and also involved a much greater responsibility.

Beside the ordinary merchant the apothecary was comparatively learned. He knew something of Latin. This, small though it was, was considered a mark of distinction by the multitude, who regarded with unaffected admiration the learning displayed by the man or boy who glibly rolled off such long and thundering terms as "aqua picis liquidæ" for tar-water; "adeps suillus præparatus," or "axungia porcina" for common lard; "sulphas aluminæ et potassæ" for alum; "tinctura opii camphorata" for paregoric; "stannum" for tin; "amylum" for starch; "mel despumatum" for honey; "extractum glycyrrhizæ" for licorice; "carbo ligni" for charcoal;

sinapis nigra for common mustard; *sevum bovinum* for common tallow; *triticum sativum* for wheat flour; "aqua pluvialis" for common rain water, etc.

The druggist of that period was really possessed of more than average intelligence, and had acquired a large amount of more or less precise knowledge as to the source, nature, uses, preparation, and dispensing of medicines. He was usually the first one—even before the physician—to whom the people had recourse in sudden emergencies or access for the more common ailments. He was expected to know how to treat burns, scalds, sprains, frost-bites, colic, and simple flesh wounds, cases of poisoning, and attacks of diarrhoea, cholera morbus, and cholera; and, generally, he treated them with prudence and success.

His chemical knowledge was moderate. He knew the official names of the comparatively limited number of "chemicals" that were then embraced in the Pharmacopœia, and was familiar with their medicinal properties, doses and uses. He knew which of them had an affinity for, and which were incompatible with, some other chemical; and also in what menstruum each was soluble and in what vehicle was best suited for its administration. He had some knowledge of tests and reagents, and could not only skilfully distinguish one chemical from another, but was also a good judge of the medicines generally.

There was no use in trying to palm off upon him as genuine, powdered opium, or ipecacuanha, or rhubarb, or aloes, which had been adulterated with powdered licorice root or some other comparatively cheap substance; or Egyptian for Turkey opium; or sophisticated for pure cream of tartar; powdered ginger, arrow root, pepper, or roots, or barks—from which the medicinal properties had been partly extracted by infusion or otherwise—for those which had not been tampered with. He could detect the cheat on the instant by sight or touch, just as he could detect a bad bill or a counterfeit shilling; and the wholesale dealer who attempted to "turn an honest penny" in this way at his expense would quickly discover that he had "waked up the wrong customer."

The druggist of those days, I am inclined to believe, was far more completely the master of all branches of his business than is the druggist of to-day, for the reason that numberless articles which he now buys ready-made, were then home-made. The druggist of those days spread all his own plasters; to spread a compound Burgundy pitch plaster quickly and neatly was one of the first lessons of his novitiate. He prepared blue mass, syrups, confections, conserves, medicated waters and perfumery. He made pills of all the standard kinds set forth in the Dispensatory—chief in demand among which were the compound cathartic, compound colocynth, compound rhubarb, aloes and myrrh, assafœtida, quinine, guaiacum, opium, etc.; also, powders of all kinds. He manufactured his own soda water, fruit syrups, seidlitz and soda powders, inks, sealing wax, putty, boiled linseed oil; he prepared fish oils for painting, copal, japan and black varnishes; he was an adept in mixing paints of all colors for retailing, and in preparing a multitude of other things.

I have said that the druggist then made his own tinctures and powders. The former were prepared in the primitive way, by digestion, and not by the more perfect process of displacement which was introduced later. Such tinctures as laudanum, paregoric, colchicum, rhubarb, and the simple and compound tinctures of bark and aloes, which were the kinds most largely in demand, were prepared in five-gallon demijohns, each of which had a label tied around its neck resembling a white clerical hanging neck band, on which the date of the original preparation was written, together with the number of days the mixture must undergo digestion; and regularly, thrice a day or oftener, it was the duty of us junior clerks to agitate it briskly so as to facilitate the process.

The process of powdering was always a laborious and sometimes very trying to the unfortunate one whose fate it was to effectuate it, and when the substance had to be reduced to an impalpable powder, many distressing hours were the lot of the operator. Especially was this the case when the substance to be so reduced was canella bark, squills, or scammony; and most intolerable of all were hellebore root and gamboge. Such sneezing as was provoked by the hellebore, and such sore eyes and noses—especially noses—as were caused by gamboge, were, in the expressive colloquialism of the day, "a caution."

The home-made syrups of that day were made of the best loaf sugar, assisted in the process of clarification by the whites of eggs or Russian isinglass. All the fruit syrups,—raspberry, strawberry, blackberry, pineapple, etc., were made direct from the fruit instead of by the aid of the factitious and unwholesome flavoring essences which were later employed.

THE DREAD CHOLERA.

My mention of the Burgundy pitch plasters in my list of home-made articles recalls an incident in my very early experience. My entrance to the calling was in the first cholera year, 1832, in the midst of the panic created by that dread epidemic. This panic was hysterical, ungovernable, and almost universal—shared in alike by all ages, from childhood to "tottering eld." The odor of chloride of lime prevaded the entire atmosphere inside our city limits and a bottle of Labarraque's Solution formed a part of the outfit of every household. The curbstones throughout the town were all whitewashed diligently and repeatedly, and our gutters flowed with a semi-fluid paste of quicklime and the chloride of lime. People shunned fruits and vegetables as if they were poison. Nearly every man, woman and child was provided with an amulet in the form of a camphor-bag, which was suspended from the neck and worn next the skin in the hollow just under the breast bone, and usually one was also carried in the pocket, where it might be easily reached by the owner to be held under his nose when feeling a passing qualm, or when traversing an unsavory locality. Almost the entire population dosed itself industriously with oil of cajeput, spiced brandy, tinctures of ginger, camphor, cloves and cayenne pepper, and other stimulating preparations, and wore Burgundy pitch plasters, *ad libitum*, on the breast or stomach, or both. The first salutations in the morning and the last at night were such cheerful ones as "such and such a one was attacked with cholera," or "so-and-so and so-and-so died of it last night;" or, "there have been so many new cases and so many deaths today." The grand staples of conversation of the streets, at the market house, in the cigar and barber shops, and at all the other head-quarters of town gossip, were cramps, rice-water discharges, collapse and sudden death, with which our citizens frightened one another until each fancied that he saw symptoms of the pestilence in some other, or felt them in his own bowels.

One morning when the epidemic was at its worst and the panic at its height, I was left temporarily in charge of the store while my elders snatched a little needed relaxation from the long strain to which they had been subjected. I had become quite familiar with the common cholera remedies and the doses in which they should be administered, and had been specially coached for the occasion by the head-clerk who was an experienced pharmacist. Of course I felt highly important over the trust that was reposed in me and felt several inches taller in consequence. As fortune would have it my first customer, quite early in the day, was a gentleman whom I had known from my very early boyhood. He was then a theological student, about 28 or 30 years old, a large, fine-looking, florid-complexioned and robust man, usually full of life and overflowing with gayety and animal spirits. He now came rushing into the store, wearing a most dejected and woe-begone appearance. "Charley," he exclaimed, after looking around in vain for the head-clerk, "Where is Boyer?" "Gone out, sir, for a while, to get some rest," I replied. "Great Heaven!" he cried, "What shall I do? I'm going to have an attack of cholera." I assured him that I could give him whatever was necessary, if he would describe his symptoms; and I ran glibly over the names of various preparations suited to various cases; but he vowed that he would have none of them. What he wanted, and he would have nothing else, was a Burgundy pitch plaster which should extend from just below his throat down to and below the pit of his stomach; and, although we had an abundance of ready-made plasters on hand, which I showed him, none of them approached these large proportions.

Now, if there was any one thing that I could do better than another, it was to spread a plaster, since I had been sedulously drilled by Boyer in that specialty until I was an expert at it. I very confidently assured my friend that I could spread a plaster, the mixture for which was always ready and had only to be melted, and could do it as well as Boyer or anyone else. "Well then," he said, "get about it as quick as lightning." I placed the plaster over an alcohol lamp, and while it was melting got out the sheep-skin on which to spread it. My friend then traced on the skin the outline of a huge pear-shaped plaster, some 16 or 17 inches long from apex to base, and I speedily cut the sheep-skin according to his pattern, after which I spread it thickly with the plaster in obedience to his repeated injunctions not to be afraid of putting on too much of it. He was a very hairy man, his breast and a considerable part of his abdomen being covered with a thick silken growth, and before leaving home he had shaved this off so that the plaster should have a chance to adhere to the skin properly. It was not long before I had the plaster in readiness, and retiring with him to a back room I clapped it on, and by the agency of a warm spatula made it adhere beautifully, at every point. No sooner was it on, and its genial warmth perceptible, than

my mercurial friend regained all his wonted buoyancy of spirits. His fears abated, his dejection vanished, he complimented me on my dexterity, and left the store cheerfully slapping his breast and stomach, and declaring that he already felt like another man.

A day or two afterward my friend again visited me, as anxious this time to get "that confounded plaster" off as he had been on his former visit to get it on. Scratching and rubbing his breast and stomach like a madman, he declared that he had not been able to sleep a wink the previous night on account of the intolerable itching caused by the confounded thing. He had tried again and again to pull it off, but it was no use, it stuck closer than a brother, and on his last last attempt to dislodge it the skin had given away, and now he was in torture. It seems that in the interval, the hair which he had shaved off had begun to grow again, and this had caused a degree of irritation which, added to that which naturally resulted from the rubefacient properties of the plaster, had now become intolerable. We took him into the back room, where Boyer and I, with the aid of a pair of scissors and the application of heated spatula, after an hour's hard work and numberless groans and ejaculations of the patient, finally rid our much tormented friend of his blanket-plaster, and put a cooling dressing on his inflamed bosom and abdomen. He had had a pretty lively experience, but he didn't get the cholera.

THE ART OF THE APOTHECARY.

The head-clerk, Boyer, came legitimately by his predilection for the drug business. His full name was Robert Eastburn Boyer, and he was a nephew of the late Thomas Eastburn who carried on the drug business for many years on Church Street midway between Peace and Dennis Streets. He was also a grandson of the old ante-revolutionary New Brunswick druggist, Robert Eastburn. He began his novitiate with his Uncle Thomas, but realizing the low scale of pharmaceutical knowledge that was attainable there, he soon sought a larger field with higher possibilities. He went to the City of New York and succeeded in getting employment with William L. Rushton, then the most famous dispensing apothecary in that city, and perhaps in the country. Here he remained some years, acquiring by gradual advancements a complete knowledge of the business in all its branches. He continued with Mr. Rushton until he was invited to become the head-clerk of the New Brunswick establishment at which I made my debut several years later, and in which he became a partner ultimately, as I also did after his death.

Boyer was an enthusiastic lover and a thorough master of his business. He understood as much of chemistry as was practically needful, and had the "materia medica" at his tongue's end, so far as related to an accurate knowledge of the properties, therapeutic uses, doses and qualities of medicines, or the manufacture of all the officinal preparations which were then in use. All these he had memorized from long practice, so that he could prepare almost any of them without reference to the Dispensatory, if it became necessary. He was, without exception, the most expeditious and most expert pharmacist that I have ever seen. The manner in which he filled a phial, or made a pill, or prepared a prescription, or put up a powder, was the perfection of ease, rapidity and skill. It was a treat to see him fold a parcel, whether large or small, and when it left his hands it was a model of symmetry and beauty.

He was as strictly methodical as he was skilful and scrupulously accurate. Everything must be done as he did it, decently and in order, and with religious care and exactitude. Everything must have a place, and must be put in its place. He exacted the utmost cleanliness and neatness even in trifles. Medicines that were in frequent demand were so dispensed by him that by no reasonable possibility could those which were poisonous be dispensed by mistake for those which were not; the former were so placed that some obstacle always interposed against their thoughtless or inconsiderate handling—either they were put so high that steps were required to reach them or they were placed behind other articles which must first be removed before they could be reached.

While medicines were being compounded or dispensed, he permitted no levity, and discouraged conversation; he required the most absolute attention to be concentrated upon the matter in hand. He felt, and he inspired his juniors to feel, that when he was thus engaged he was exercising a grave trust which involved not only health, but possibly life or death. He was one of the most conscientious of men, and this feature of his character extended to the minutest of his dealings as an apothecary. He gave and he exacted just weight and measure. He tolerated no sophistication of medicines, however trivial they might be. Whatever medicine he sold would

produce the desired result, so far as related to its powers and properties. He hated lies and dissimulations, whether acted or spoken, and was accustomed to say that the apothecary who knowingly sold a tincture, preparation or drug which was below the standard in strength or quality, was a liar and a cheat, and might become a homicide.

Boyer was the first to bring to the drug business in New Brunswick a thorough equipment for the pharmaceutical department. Before his return to our city from New York our druggists rarely, if ever, compounded physicians' prescriptions, for the reason, primarily, that our physicians then kept their own medical supplies and prepared their own preparations and prescriptions. The dispensing of medicines in the nature of prescriptions was almost exclusively confined to the preparation of some special recipes for their owners, or the administration, as they were called for, or doses of calomel and jalap, rhubarb and magnesia, tartar emetic, Dover's powder, quinine, castor oil, purgative pills, cholera mixtures, and a few other articles.

PATENT MEDICINES.

In 1832, and for some years later, there were comparatively few patent or proprietary medicines of American origin—the principal among them being Swain's Panacea, Swain's Vermifuge, Lee's Anti-bilious Pills, Thompson's Itch Ointment, Ditchett's Pile Remedy and Miles' Tomato Pills. That, it may be said in parenthesis, was before the day of Brandreth's pills and plasters, Dalley's Salve, and the hundreds and hundreds of other nostrums which have since come into vogue.

There were, however, a goodly number of these, of trans-Atlantic origin, the formulas for which were given in all the dispensatories of the day, and which were manufactured and put up by druggists, enclosed in descriptive wrappers, with directions for their use, which were bought by the quire or ream, ready printed. In all these descriptive wrappers, the antiquated type and spelling, and the old-time quaint and ornate phraseology were preserved—some of them opening with a preface in such swelling words as these: "Medicamentum gratia probatum est;" "This is a Capital of great Antiquity and established Reputation;" "Elixir of Health and Universal Catholicon," etc., etc. Among the most popular of these proprietary articles of foreign origin and pretended foreign manufacturer were the following: Steer's Hard and Liquid Opodeldoc, Bateman's Drops, Hill's Balsam of Honey, Ching's Worm Lozenges, Betton's British Oil, Haalem Oil, Elixir Proprietatis, Godfrey's Cordial, Dalby's Carminative, Daffy's Elixir, James' Powders, Hooper's Female Pills, Anderson's Scott's Pills, Robertson's Pills, Lozenges Bitters, etc., and Turlington's Balsam. The last named was also variously known, and called for, as Friar's Balsam, Vervain Balsam, Traumatic Balsam, Commander's Balsam, Jesuit Drops, Wade's drops, and Compound Tincture of Benzoin.

HERBAL AND POPULAR MEDICINES.

In those days the herb and root closet formed a most important adjunct of every well-equipped drug store. Among the simples which were always to be found in it were specifics which, in the popular belief, were remedies severally for nearly all the "ills that flesh is heir to." Such of them as were the most largely in popular use were these: mint, boneset, horehound, catnip, balm, saffron, sage, pink-root, snake-root, blood root, stramonium, fox-glove, sweetfern, mandrake, wormwood, wormseed, blessed thistle, or carduus benedictus, lovage, liverwort, calamus, elecampane, comfrey, dill seed, marshmallow root, bayberry bark, sumach berry, black cherry seed, white oak bark, celandine, hyssop, pellitory, yellow dock root, dandelion root, feverfew, mezereon bark (popularly leather-wood), spikenard, sassafras, pennyroyal, rosemary, rue, elder flowers, thyme, Solomon's seal, life everlasting, tansy, coltsfoot, etc., etc.

Blood root was a specialty with the negroes, who called it, according to its fracture, salmon colored or dark red, "queen root," and "king root," or "she" and "he" root. They believed it to be *rooty*, or in other words, to have the power to avert spells wrought by other unfriendly negroes through the agency of the malign fetich Oby (O—beah) and also to exert a propitiatory or fascinating influence upon the other sex.

Catnep was the orthodox remedy for colic in babies, as mint and pennyroyal were for the same enterprising complaint in adults. Sweetfern was esteemed as a cure for pimples, wormseed (sprinkled on a slice of bread and butter) for worms, boneset for rheumatic fevers, horehound for coughs and colds, liverwort for pulmonary and hepatic affections, saffron for measles and scarlet fever, digitalis (fox glove) for asthma, celandine for warts, pink-root for worms, pellitory for tooth-

ache, sumach berries for sore throat and scarletina, blackberry bark and root for diarrhoea, and blessed thistle for nearly all imaginable, and all imaginary diseases.

The nostrum department, consisting of empirical preparations that were kept regularly in stock and dispensed in response to popular calls from the ruder and more ignorant classes, and which belonged entirely outside the list of proprietary medicines, was a considerable one. To it belonged, among others, the following: oil of tar, oil of stone, oil of spike, barbadoes tar, seneka oil, (crude petroleum), oil of earthworms, frog-spawn water, aqua mirabilis, balsam of sulphur, skunk's grease, dog-fat, goose grease, dried snails, prepared wood-lice or millipedes, compound powder of millipedes, egyptiacum, and others equally as crude.

I recall some of the vulgar or popular appellatives that were often applied to the articles sold by old-time druggists, and with which they were as familiar as they were with their true names. These dialect colloquialisms of home manufacture may not be devoid of interest to the student of philology. Thus: Allspice was called "Jamaica pepper;" Cloves "pepper-nails;" powdered hellebore root "sneezing snuff;" oil of origanum, "King of oil;" roll sulphur, variously, "brimstone," "cane sulphur" and "hell timber;" stramonium, respectively, "stink-weed," "Jamestown weed;" and "Jimson" lobelia "Indian tobacco;" quicksilver ointment, "blue ointment" and "anguintum;" gum tragacanth, "gum dragon;" cocculus indicus or indian berries, as "fishberries," and "cock-a-nanny berried;" Peruvian bark, severally, "barks", "Jesuit bark," and "Jesuit's powder;" turpentine, "terps;" Glauber salt, "horse salts;" annatto, severally "auter," "aranetta and "yaller auter;" feverfew, "featherfew;" prepared chalk, "crab's eyes;" sweet spirit of nitre "fever drops;" oxide of *tin*, "polishing putty;" Nicaragua wood "nigger auger;" carbonate of ammonia, "hartshorn" and "sal volatile;" mandrake root, "mandragora," and from its resemblance to the human form, "old-man-in-the-ground;" and finally, assafœtida, which was variously known as "tuybel's truyck," "devil's dung," and "asaferty." The last was the expressive Irish term for the fragrant drug. All the variations seem to have been suggested by the old Turkish legend that on the spot where Satan first set his foot when he stole into Paradise the assafœtida plant sprang up for the first time in the world.

It will not be altogether unappropriate to recall at this point a few particulars as to the popular practices and beliefs of some of those who patronized the old-time druggists. Thus: the use of opium was very prevalent among all classes, but was generally furtive. The rich bought it by the ounce, and even by the pound. The price at that time being three shillings an ounce, and $5.00 a pound. The poor bought it by the quarter or half-ounce. To the former it was a destructive, dreamy and benumbing intoxicant, and to the latter it afforded a temporary refuge in forgetfulness. It was easy to tell the regular opium eater, by the peculiar puffed appearance of his face, and the semi-opaqueness and dead-yellow color of his complexion. Many of those who were regular opium eaters were also inveterate consumers of Scotch snuff which they bought by the ounce, pound or bladder (according to their means) and with which, by the aid of their fingers, or of a stick padded at one end, they rubbed their gums and teeth.

It was a popular belief that common black pitch, or burgundy pitch, if chewed, averted consumption, cured shortness of breath, and also sweetened the breath and preserved the teeth; consequently, many persons chewed both as assiduously as some young people nowadays use chewing gum.

Another popular belief attributed the cure of rheumatism to the wearing of a piece of roll sulphur in the pocket. It was usually worn in pieces about two inches long, and was replaced every fortnight by a fresh piece—the idea being that its virtues had departed or had been absorbed by the patient. A like belief extended to horse-chestnuts, and to cubical pieces of raw turnip or carrot, which were worn in the pocket for rheumatism, and similarly changed every few weeks.

A popular old wives' remedy for freckles and pimples was a tea made of sweetfern leaves, which was taken freely internally and was applied as a lotion externally. Also, the white streaks, which are found in the excrement of fowls, were another popular medicine. This was carefully scraped away from the attendant dark colored excrement, after which it was dried by exposure to the sun or fire, and was then used as a sternutatory, or applied to old sores or ulcers as an escharotic. Cobweb was largely used as a styptic, for which it was quite effective in slight cases; and it was also rolled into pellets and taken as a cure for fever and ague.

To assafœtida were attributed many virtues, alike for man and beast. Worn in a bag on the breast, it was considered a sovereign remedy for convulsions and whooping cough in children,

and as a preventive of chills and fever in adults. Wrapped in cloth and used to plug a hole that had been bored in the manger, or to tie on the bit, it was credited with giving horses who were "off feed" an appetite, and also with causing their coats to become smooth. It certainly was greatly liked by horses, who would lick with great avidity the hole in which it had been deposited. It was also a great favorite with negro anglers, who used it liberally sprinkled on their bobbing-bait, and declared that it induced fish and eels—especially the latter—to bite.

DRUG STORE EQUIPMENT.

The implements and apparatus of the apothecary department of the druggist of the period of which I am writing, deserves mention. There were scales and weights—handsome brass beam-scales with brass weights; an apothecary's small scale. There were minim-glasses, and graduates; small glass or porcelain mortars for acids and corrosives, wedgewood ware, filtering funnels and mortars of different sizes; marble mortars having wooden-handled pestles; iron mortars from the capacity of a pint to that of two gallons; a set of porcelain pill slabs and a pill machine; several broad wooden spatulas for rolling out pills, and steel spatulas of every size; alcohol lamps and stands equipped with pint, quart and half-gallon boilers; plaster pans and kettles, syrup kettles, copper boilers with faucets for preparing opodeldoc, and earthen vessels for the preparation of cerates and ointments; glass retorts and receivers, metallic forms for packing ounce, four-ounce and half-pound parcels of epsom salt and other articles which were in brisk demand; wooden spoons or ladles graduated to the proper size for soda and seidlitz powders; a water-bath, a sand-bath and a vapor bath; porcelain evaporating dishes of various sizes; several sets of hair and wire sieves, and a drum sieve, several sets of wine measures from a gill to three gallons each; mills suitable for grinding cloves, cinnamon and other spices, and for the coarser roots and barks—together with petty implements which need not be particularized.

THE JUNIOR CLERKS.

Any view of the business of that time would be exceedingly imperfect which left out of sight the part borne in it by junior drug clerks and their condition. Their lot was a pretty hard one, but it is due to say that in the long run it proved a wholesome discipline to them; certainly, they were none the worse for it. Moreover, unlike the younger clerks of our more luxurious day, they had not eaten sufficiently of the fruit of the tree of the knowledge of good and evil to know how hard their lot was, or indeed to care much about it, far less to whine about it. They were kept incessantly at work, and their hours of work were long. They had but little time for mischief and still less for excesses of any kind, and they had no cause in later life to lament that such was the case. They acquired fixed habits of industry and application. They were preserved from numerous temptations to which the clerks in other less exacting callings were exposed, and to which they too often succumbed, and they enjoyed their few holidays with a zest and relish.

But although our noses were held close to the grindstone, and notwithstanding that we had but little spare time at our disposal, we had had our own fun. Much of our fun and mischief found their opportunity in connection with our business, as the following anecdotes of my own experience will disclose.

At that time there were a great many apprentices to the various trades that were followed in our town, and in the vicinity of "our store" there were several large shoemaking shops which had their full quota of apprentices. The younger and greener of these were the butts and fags of the older apprentices and the juniors who indulged in much horse-play and many rough practical jokes at their expense. For instance, when the hands of a new apprentice became black, grimy and rough from the dirty work which was placed upon him by the older apprentices, they would send him with his little savings to the drug store with instructions to invest in a sixpence, or a shilling's worth of *pigeon's milk*, assuring him at the same time that it would make his hands soft and white. Of course the older apprentices had been through the mill themselves and knew what would follow. The young gudgeon invariably applied for the mythical pigeon's milk to one of the younger drug clerks, and he being in the secret would give him, with an air of grave importance, the coveted specific, in the form of an infinitesimal quantity of linseed oil and lime water, with directions to rub in a few drops of it night and morning. As these directions also included an injunction to the young fellow to wash his hands carefully with soap and water before applying the pigeon's milk, otherwise something frightful would befall him, it is probable that the specific

proved reasonably efficacious. At any rate, we enjoyed the joke, and got his sixpence or shilling.

As almost all these apprentices belonged to the lower classes and were exceedingly ignorant, they were often very superstitious. They believed in spooks and witches, and were terribly afraid of both. The older apprentices, working on these fears, would send the younger ones to us for "spookoil" or "witches grease" as the fancy seized them, whereupon we mysteriously gave them a small vial of ill-smelling liver oil as a charm against spooks, or an ointment composed of a little lard and a good deal of powdered assafœtida, to be worn as an amulet against the incantations of witches. I can safely avouch that no apprentice who was thus panoplied ever thereafter saw a spook or suffered from the cantraps of a witch.

LOVE POWDERS.

The darkies of that day were the most superstitious of all. They were implicit believers in the powers of roots and herbs and were frequent applicants for them in order to counterplot against their enemies and ward off or neutralize their evil intentions. They were wont to declare that such or such an one was a "rooty nigger," and that he had laid a spell on them by placing some "power root" over the lintel of a door under which they had been obliged to pass; and they must have some blood root, or old-man-in-the-ground, or Solomon's Seal, or sweetfern, to chase away the spell. They were even better customers for love powders, for which they always sneakingly applied to us juniors, with earnest appeals to our sympathy and secrecy, and with which we always sent them away rejoicing, after having pocketed their shilling or quarter. For our part we experienced not a little high art in dealing with these credulous fellows. When one of them craved a love powder, we demanded to be told with the utmost exactitude the color of his inamorata—whether she was light or dark yellow, copper-colored, or downright black; whether she was short or tall; and whether her hair was long or kinky—after which we adjusted the powder accordingly and with great show of mystery, out of pale or dark yellow, or red Peruvian bark, or of the bark of black cherry. We then enjoined upon him that he must never let it go out of his possession for an instant, and that he must swallow it immediately before he crossed under the lintel of the doorway of the house where his sweetheart lived, the while keeping his thoughts fixed intently on her.

An honest fellow whom I once assisted in this way came to me a few days afterward in high glee. The thing had worked first rate, he told me, and his girl who before had told him half a dozen times "to g'long about his business" had at last relented and had promised to marry him, which she did, and sent me a piece of their wedding cake. Both she and her husband always regarded me as their benefactor; for in their case at least, humble though they were, marriage was not a failure. He repeatedly declared that "ef it hadn't a-benn" for me, his wife "wouldn't a-had him;" and his wife, who had learned the whole story, did not contradict him, so he must have been right.

One of our old-time darkies, known to every boy in the town as "Har," was a jovial, good-natured, and good-hearted fellow, very bright and witty except when he was drunk, and then he degenerated into a great fool and a portentous bore. One day he came into our store, decidedly under the weather from drink, while I was engaged at putting up a supply of seidlitz powders. He was feeling "dreadful bad," he said, and he pestered me to give him something to put him "to rights." Full of mischief, I at length assented; whereupon I dissolved the acid portion of a seidlitz powder in one tumbler half-full of water, and the alkaline portion in another, and then administered them to him, one after the other. Of course, the effervescence, instead of taking place before drinking, as usual, took place afterward with the most amusing results. Har spluttered and hiccoughed, and hiccoughed and spluttered; the mixture forced itself out of his mouth and nose; tears streamed from his eyes, and he was literally frightened sober. After that, no matter how drunk he might be, Har knew enough not to trust me to give him a dose of medicine again; though, for my part, I should never have repeated the joke a second time, for I was nearly as much frightened as he at its results.

FUN IN A DRUG STORE.

A former schoolmate of mine, who was a clerk in a neighboring store, fell into the habit of dropping into our store in the evenings, when he pestered me with queries which I had no mind to answer, since they often related to the "art and mystery" part of our business. This became very

annoying, the more so since it was a rule in our establishment, which we were all expected to obey, that we must not hold prolonged talks with anyone while we were busied on anything that required our attention, but must devote ourselves exclusively to it. One evening when I was thus occupied he was specially inquisitive; and as I did not reply to him as freely or as cordially as he thought was his due he became offended, "put on frills," and made some contemptuous comparisons between his leisure and my slavery, and also between his trig clothes (he was a natty dry-goods clerk) and my coarse overalls. Of course my dander was up and I made up my mind that I would get even with the gentleman. So, betimes one evening when I was pretty sure he would make one of his customary calls, I lifted our largest iron mortar up on the counter, placing its 15-pound pestle beside it, and then sprinkled a goodly lot of fulminating powder over the bottom of the mortar. In due time he made his appearance and began his usual questioning, which I managed to divert to the big mortar and pestle. It was not long before I succeeded in irritating his bump of combativeness by insinuating that it was a man's work to handle that pestle, and more than a match for the muscle of any womanish counter-jumper. This nettled my lad. He got mad, said he'd show me that he could handle it as easily as I could, and, coming beside the counter, he took it up, flourished it around, and wound up by plumping it into the mortar so that its whole weight came squarely upon the fulminate. The consequence may easily be imagined. The fulminate exploded with a whiz and a bang, knocked the pestle out of the young fellow's hands, half suffocated him with its smoke, more than half frightened him out of his wits by its flash and noise, and he got out of the shop without standing on the order of his going.

A DAY'S WORK IN A DRUG STORE.

My summer's day work began at 5:30 in the morning with taking down the iron bars, and opening the window shutters, and ended with closing and barring them again at 10 o'clock at night; and in the winter by going through the same performances, respectively, at 6:30 in the morning and at 9 o'clock at night. The work that filled in the interval may not be dismissed so briefly, and was as follows: First, after opening the windows I successfully made the fires; swept out and sanded the floor; hung out the signs; cleaned, trimmed and filled the hanging, side and hand lamps; cleaned the lamp shades and glasses; polished the scales and other brass fixtures of the establishment; and cleansed and brightened the pint, quart, half-gallon and gallon measures that were used for sperm and other lamp oils. Then there was an intermission of half an hour for breakfast. When that was despatched, in the intervals of waiting on occasional customers for lime, sand and tar, paints and oils, doses of salts and castor oil, and pennysworth of paregoric, Godfrey's cordial, black or Scotch snuff, saleratus, etc., I was obliged to wash and replenish such of the quart tincture bottles as were in the most constant use, fill up the various filtering funnels which had run empty during the night, and to cleanse the glass of the show-cases, and the inside sashes of the show windows. By this time, if it were a fair day, business had set in, and from then until tea-time, with the exception of another half-hour's intermission for dinner, I was incessantly on the go, measuring all kinds of oil; weighing all sorts of paint, dye-stuffs and other articles; measuring lime, sand, cement, plaster, etc., rolling and loading barrels, with an occasional period behind the counters putting up sundries both fluid and solid, which had been ordered by country merchants; or waiting on some retail customer for roots, herbs, essences, and a hundred other commodities. After tea, just as we read that "When the evening shades prevail, the moon takes up her wondrous tale," so also did I resume mine. First the floor must be cleanly re-swept, and newly sanded, and then I was set busily at work, with frequent interruptions, to answer calls from customers for one thing or another, at putting up gross after gross of soda or seidlitz powders, and still other grosses of essences, tinctures and proprietary medicines, together with dozens of bottles of ink, or Stoughton's bitters, or bay rum, cologne, etc., and other dozens on dozens of packages of drugs, dye-stuffs and paints, preparatory to the possible demands of the next day.

It was the rule in our store that the clerks should never sit down during business hours. From the opening of the store in the morning until the close at night, there never was an idle moment. If the routine work was done and no customers waiting to be served, there were sundry preparations for the future to be made. There were opodeldoc, or British oil, or Haarlem oil, or balsam of honey, or Turlington's balsam, or Godfrey's cordial, or paregoric, or essence of peppermint, or hair oil, or some other article for which there was a brisk demand, to be filled and put up in dozen packages; there were soda and seidlitz powders to be put up; castile and other soaps to

be sawed off into salable sizes; spices to be ground; roots and drugs to be powdered; syrups, cerates, ointments and plasters to be made—in fine, there was ever something or other to be done, and it fell mainly to the lot of my chums and myself to do it. In addition, we assisted in the preparation of boiled linseed oil and varnishes, and regularly on Saturday evenings we were required to wash all the quart tincture bottles—fifty or more in number, and then wound up the week's work after the store was closed, by scraping the floor of the oil room, and scrubbing and oiling the counters of the store. All this was still further diversified, on dull or stormy days, by varnishing the drawers and closet doors, and also the labels on the tincture and spice bottles, painting the ceiling and plain woodwork, and at suitable intervals by a general washing-up of all the show and large tincture bottles, and the insides and outsides of the shop windows.

Notwithstanding the long and laborious hours which signalized the lot of the junior clerks in our drug stores, and of the apprentices to many of the trades, these hardworked young fellows felt a craving for intellectual advancement, and under its impulse worked hard and in the face of many disadvantages for mutual self-improvement and culture. Ten or twelve of us among my acquaintances formed a musical club, at which under the direction of a singing master, we met once a week by turns, in the stores where we were employed, after they were closed for the day, and rehearsed ourselves in sacred and secular music, in which some of us became experts. We had also a vigorous debating club.

SPRING CLEANING.

It was then the almost universal custom and the usage may yet survive, for our farmers and country folk generally to indulge in what they called "Spring Physic."

Regularly on the return of Spring, each of these dosed himself and his wife, his son, his daughter, his manservant and his maidservant, his ox and his ass, and everything that was his—the humans with generous doses of senna, salts and manna, and castor oil, and the others with Glauber's salts, fenugreek seed, black antimony, and horse balls in which aloes bore the leading rôle. Even the pigs, chickens, ducks and turkeys came in for their share in the general physicking. In town, this practice took the form of weekly doses that were heroically swallowed by our good people. On Saturday evenings especially there was a rush to the drug store for doses of calomel and jalap, rhubarb and magnesia, compound cathartic pills, Lee's pills, castor oil, epsom salt, hiera picra, and other brisk purgatives, whose effects our mechanics, laborers, artisans and townsmen generally, had the time or the leisure to attend to only on Sundays.

AFTER THOUGHTS.

Since the days when Mr. Deshler was a clerk in this old drug store much water has passed under the bridge.

The store in which he served is still a drug store, but how great have been the changes in human affairs. Mr. Deshler's customers arrived in ox carts, Conestoga wagons, on horseback or in the stage coach. Since that time have come the steamboat, the railway, the trolley, the bicycle, the auto and the aeroplane.

In this century-old picture we see the Drug Clerk lighting the store with candles, sperm oil and camphene. The store has since been illuminated with gas, kerosene and the electric lamp.

Wood stoves heated the store during its early period; afterward came coal oil, and steam heat.

The old store has been a witness of the progress of science and the wonderful discoveries and inventions that fill the annals of the century in which it has existed, the steam engine, the telegraph, the telephone, photography, the dynamo, the Roentgen rays, wireless communication, the radio; the advancement of physics and engineering as exhibited in electricity, radiant energy, machinery, industry and the arts.

The dispensing counter of this store has been witness to the most stupendous changes in medicine and surgery that have taken place since the dawn of history.

Percolation has routed maceration; coated pills, compressed tablets, capsules, ampuls, have displaced the pill tile; drug milling has abrogated the mortar and pestle; plaster-spreading in the drug store has become a lost art. Fluidextracts, elixirs, concentrations, resins, alkaloids, and a host of them have come and some of them have gone their way. Blood letting and blistering have been forgotten. The tar barrel has been the horn of plenty, and from it have come the anilines and the synthetics. Every whirl of the benzene ring has given forth the inumerable new, remedies.

From the germ theory of disease, bacteriology has been created. The dread cholera so vividly described in this paper, and other maladies, have been swept away through preventive medicine.

Serums, antitoxins, X-rays, physiotherapy, radio energy have displaced sulphur and Tansy bitters. Ether and chloroform, antiseptics and aseptic methods have revolutionized surgery and created the wonderful hospital systems which now cover the earth. The hand of death has been stayed in a thousand ways and human life has been prolonged, while this old store has day after day opened its doors to fill its patrons' needs.

This drug clerk of a hundred years ago never sold a postage stamp, for the reason that there was no such thing; but his notes reveal the fact that pharmacy has had its problems in all ages.

Since the time noted in this paper, the population has increased from ten to one hundred and twenty million. Drug stores have been multiplied by fifty. The training of apprentices, so clearly described in the memoir, has created more than three score Colleges of Pharmacy. Great National and State Pharmaceutical bodies create and guide the policy of advancing pharmacy.

A century ago there was a free trade in drugs and poisons (except to slaves); the judgment of the conscientious pharmacist, however, acted as a potent safe-guard. In these latter days laws and regulations without number, in part beneficial, in another part burdensome, control the sale of drugs.

Of amusing interest are the notes in respect to the sale of intoxicating liquors now restricted by the burdensome Volstead Act.

This old store has witnessed stupendous changes in the drug trade. During its life pharmacy has leaped forward a thousand years. It is still moving upward and onward. Let us hope that some drug clerk will note down his experiences in the present remarkable period in Pharmacy for the edification of his followers a hundred years hence.

PRODUCTION AND FOREIGN TRADE IN NATURAL AND SYNTHETIC CAMPHOR IN GREAT BRITAIN.

Official British statistics relating to synthetic camphor are practically nonexistent, but a reliable estimate is, that imports of this product would probably vary from 50 to 750 long tons or even more annually. It is understood that synthetic camphor is not manufactured in Great Britain, at least for general sale, although it is believed that some production has been undertaken by one or two firms for their own use, in the manufacture of celluloid.

CORNER-STONE OF COMMERCE DEPARTMENT BUILDING LAID.

The corner-stone of the new Commerce Department building was laid by President Hoover, June 10th. The building, which will occupy three city squares and contain 1,092,000 feet of floor space, is to house all the activities of the Department of Commerce in Washington, with the exception of the Bureau of Standards.

THE DEPARTMENT OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY

H. M. Lerou, President, Norwich, Conn. J. W. Gayle, Treasurer, Frankfort, Ky. M. N. Ford, Chairman of Executive Committee, Columbus, Ohio. H. C. Christensen, Secretary, 130 N. Wells St., Chicago, Ill.

ACTIVE MEMBER STATES.

Alabama	Indiana	Montana	Rhode Island
Alaska	Iowa	Nebraska	South Carolina
Arizona	Kansas	Nevada	South Dakota
Arkansas	Kentucky	New Hampshire	Tennessee
Colorado	Louisiana	New Jersey	Texas
Connecticut	Maine	New Mexico	Utah
Delaware	Maryland	North Carolina	Vermont
D. of Columbia	Massachusetts	North Dakota	Virginia
Florida	Michigan	Ohio	Washington
Georgia	Minnesota	Oklahoma	West Virginia
Idaho	Mississippi	Oregon	Wisconsin
Illinois	Missouri	Pennsylvania	Wyoming

TENTATIVE PROGRAM OF
NATIONAL ASSOCIATION OF BOARDS OF PHARMACY, TWENTY-SIXTH ANNUAL CONVENTION.

Alex Johnson Hotel, Rapid City, South Dakota, August 26 and 27, 1929.

MONDAY, AUGUST 26, AT 9:30 A.M.—*First Session.*

1. Call to Order, President H. M. Lerou.
2. Roll Call.
3. Appointment of Committee on Credentials, President Lerou.
4. President's Address, H. M. Lerou.
5. Appointment of Committee on President's Address.
6. Report of Executive Committee, M. N. Ford, Chairman.
7. Report of Secretary, H. C. Christensen.
8. Report of Treasurer, J. W. Gayle.
9. Report of Committee on Constitution and By-Laws, Herbert Parker, Chairman.
10. Paper, Suggestions for Improving the N. A. B. P. System of Reciprocity, Robert P. Fischelis.

MONDAY, AUGUST 26, AT 2:00 P.M.—*Second Session.*

1. Report of Committee on Extension Study for Board Members, Robert L. Swain.
2. Report of Legislative Committee, P. H. Costello, Chairman.
3. Report of Committee on Credentials.
4. Appointment of Nominating Committee.
5. Report of Advisory Examination Committee, H. C. Christensen, Chairman.
6. Report of Syllabus Committee, George Judisch.
7. Report of Committee on National Legislation, A. L. I. Winne, Chairman.
8. Report of Committee on Drug Store Ownership Law, Jacob Diner, Chairman.
9. Verbal Reports of Vice-Presidents:

District No. 1—George O. Tuttle
District No. 2—L. N. Richardson
District No. 3—John A. J. Funk
District No. 4—George Judisch
District No. 5—F. B. Haymaker
District No. 6—Clarence M. Anderson
District No. 7—W. E. Bingham
District No. 8—Joseph P. Murray
District No. 9—A. G. Hulett

10. Appointment of Resolutions Committee.
11. Report of Committee on Banquet Arrangements, L. L. Walton, Chairman.

MONDAY, AUGUST 26, AT 6:00 P.M.

Banquet of National Association of Boards of Pharmacy. Business meeting to follow, if found necessary.

TUESDAY, AUGUST 27, AT 7:00 A.M.

The Local Committee has arranged for a tour of Rapid Canyon, Black Hills, starting at 7:00 A.M. Tuesday morning, returning about noon. All board and college faculties members are invited to attend.

TUESDAY, AUGUST 27, AT 2:00 P.M.

Joint Session, National Association Boards of Pharmacy and American Association of Colleges of Pharmacy.

1. Report of Fairchild Scholarship Committee, E. G. Eberle.
2. The Fairchild Scholarship, How and to Whom Shall the Award Be Made, E. G. Eberle.
3. Report of Committee on Study of Pharmacy and Pharmaceutical Education, L. L. Walton, Chairman.

TUESDAY, AUGUST 27, AT 8:30 P.M.—*Third Session.*

1. Report of Committee on President's Address.
2. Report of Advisory Publicity Committee, Robert P. Fischelis.
3. Report of N. A. B. P. Committee on Prerequisite Legislation, William R. Acheson.
4. Report of Grievance Committee, H. G. Ruenzel, Chairman.
5. Report of Committee on National Certificate, H. C. Christensen.
6. Final Report of Committee on Constitution and By-Laws, Herbert Parker, Chairman.
7. Reports of Special Committees.
8. Unfinished Business.
9. New Business.
10. Report of Nominating Committee.
11. Election and Installation of Officers.
12. Adjournment.

FIFTH INTERNATIONAL BOTANICAL CONGRESS.

The Fifth International Botanical Congress meets at Cambridge, England, August 16th–23rd, with excursions during the following week. Secretaries, Dr. F. T. Brooks, 31 Tension Ave., Cambridge, England, and Dr. T. F. Chipp, Royal Botanic Gardens, Kew, England.

JUBILEE CONFERENCE OF NEW ZEALAND PHARMACEUTICAL SOCIETY.

The Golden Jubilee Conference of the New Zealand Pharmaceutical Society took place at Napier on March 5th–7th inclusive. A civic reception was accorded to the delegates; the Mayor (Mr. J. Vigor Brown) made the welcoming address. In the course of his reply President Rickard stressed the necessity of chemists continuing their studies. During the Conference opportunity was taken to present a grandfather's clock to Mr. F. Castle, and to convey to him, on his retirement from office, the Society's appreciation of his seventeen years' service as president.

The first Conference was held in 1879, and New Zealand's first Pharmacy Act was passed in 1880.

FRENCH ASSOCIATION OF ARMY RESERVE PHARMACISTS.

"The Association of Army Reserve Pharmacists" organized a series of lectures on technical matters for its members this winter and spring, partly at the Sorbonne (Faculty of Science), and partly at the Faculty of Pharmacy. These include "The Pharmacist in Hospital Trains," by Pharmacist-Major Labruyere; "The Pharmacist at the Front," by Pharmacist-Lieutenant Lenoir; and "The Pharmacist's Part in the Training of Sanitary Squads," by Pharmacist-Lieutenant Herissey, who is a Professor at the Faculty.

THE DEPARTMENT OF THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY

C. B. JORDAN—CHAIRMAN OF EXECUTIVE COMMITTEE, A. A. C. P., EDITOR OF THIS DEPARTMENT.

Your editor is pleased to offer this excellent address of President A. G. DuMez for consideration of the readers. The address emphasizes many important points that should be considered by all retail pharmacists and teachers of the profession.

C. B. JORDAN, *Editor.*

PHARMACISTS MUST RETURN TO THE PRACTICE OF PHARMACY IF THE CALLING IS TO ENDURE.*

BY A. G. DUMEZ.

Pharmacists must return to the practice of pharmacy if the calling is to endure is the opinion expressed by certain members of the medical profession who have taken a friendly interest in us and the firm conviction of those who are looked upon as leaders in our ranks. It is likewise the conclusion which I have reached after as careful an analysis of conditions, past, present and future, as I am capable of making. To demonstrate to you that a turn-about-face on our part is the best, if not the only means, of insuring our future welfare as pharmacists, and to point out to you how this may be accomplished is the purpose of my address this evening.

Pharmacy as originally practiced was in a true sense the handmaid of medicine and the service which it rendered required an intimate and comprehensive knowledge of the materials dealt in, that is the *materia medica* of the day. It then functioned as a trained body for gathering, storing and transforming, or compounding, drugs and chemicals into forms suitable for administration to the patient and, in addition, it served the physician and the public as the only reliable source of information on these materials.

The practice of pharmacy in its beginnings in this country, and even as late as thirty years ago, consisted in the main of the performance of the operations necessary to the exercise of the foregoing functions. Vegetable drugs and chemicals were as a rule purchased in bulk. Some of these were packaged for sale to the public, others were stocked for the compounding of prescriptions; but the greater number were stocked for the manufacture of the galenical preparations, which at that time made up the more important items of our *materia medica* and almost all of which were made by the pharmacist. The furnishing of drugs, chemicals, medicines and other sick-room supplies then constituted the major service rendered by pharmacy. General merchandising, although practiced to some extent, had not yet reached sufficient proportions to be considered a distinct service.

That pharmacy as practiced throughout the land to-day offers a variety of services so different from that rendered even thirty years ago as to almost completely obscure in many cases the purpose it was originally intended to serve, I am confident no one will attempt to deny. That this change in the kind of service

* An address delivered before the Golden Anniversary meeting of the North Carolina Pharmaceutical Association, Asheville, N. C., June 19, 1929.

given, especially in so far as it has disturbed the old relationship of the pharmacist to the physician and to the public, and to the extent that it has over-stimulated the tendency toward commercialism, is largely responsible for the difficulties we are facing at this time is my contention.

There are some who argue that the present unsatisfactory conditions in pharmacy have been brought on by an unduly large increase in the number of drug stores. Others attribute them to indolence on the part of the pharmacist and his failure to keep pace with modern progress in store management and merchandising. Still others hold that they are the result of new competition in the form of the department store, the five and ten cent store, the cigar store and the candy store, many of which now sell merchandise originally handled exclusively by the drug store.

The fallacy of the first argument is readily proven. By referring to available census statistics, I find that the population of this country was 62,947,714 in 1890 and in 1928 it was estimated to be 120,013,000, which represents an increase of slightly more than 90 per cent. During the same period, the number of drug stores increased from 33,000 to 57,000, which represents an increase of approximately 73 per cent. In other words, the population has increased more rapidly than the new stores and to-day the proportion of drug stores to population is about 17 per cent smaller than it was forty years ago. It is true that these census statistics do not take into consideration the changes, if any, which have taken place in the distribution of stores. It is possible that in some localities, the cities for instance, the number of new stores opened has kept pace with the increase in population, or even exceeded it. This possibility, however, adds little force to the argument, as current reports indicate that the same unsatisfactory conditions prevail throughout the entire country whether it be in urban or suburban localities.

The assumption that pharmacists are not as industrious and ready to adopt modern methods of store management and merchandising as other merchants would also seem to be erroneous. We have ample evidence all about us of the merchandising ability of the pharmacist. In fact, this particular phase of modern progress is all too evident in many cases. Pharmacists in general have not only adopted the very latest methods of store management and merchandising, but in many instances they have employed these methods so skilfully that the merchandising phase has almost completely obliterated the professional phase of the calling and still they are not contented. No, this is not the reason for the present unrest in pharmacy.

There is undoubtedly some basis for the contention that new competition from sources outside of the drug field has made marked inroads on the pharmacists' legitimate field of profit. The department stores, five and ten cent stores, candy stores, etc., are now doing a large proportion of the business in patent medicines, toilet articles, perfumes and other items formerly handled exclusively by the pharmacist, but this loss of business is not sufficient by itself to account for the general dissatisfaction that prevails throughout our ranks.

These and the other arguments based on similar premises, when examined individually, can usually be shown to be unsound or to account only for unsatisfactory conditions in certain phases of the calling. Taken collectively, they probably do serve to explain why it is that there is not as much profit to be made

in the retail end of pharmacy as the more commercially inclined members of the calling desire; but they do not explain why it is that the pharmacist is losing prestige with the physician and the public, why he is dissatisfied with his present status nor why he is fearful of what the future holds for him.

I do not wish to be understood as decrying all commercial activities of the pharmacist, nor would I have you believe that I am trying to disparage his efforts to become a better business man as I am fully aware of the fact that as long as pharmacists deal in material things, there must be commerce. I do, however, desire to impress upon you that the real cause of the difficulties in which we find ourselves at present is not an undue increase in the number of drug stores, the lack of good business management or the adoption of up-to-date merchandising methods, but rather the over development of the commercial side at the expense of the professional side of the calling and that progress in the future, and perhaps our very existence, is dependent upon the restoration of professional pharmacy to the important place in the store that it once occupied.

It is an established principle among physicians that to prescribe intelligently for the alleviation or cure of a disease, the cause must first be found. This principle applies with equal force to the selection of the proper remedy for the correction of bad conditions of affairs of any kind and may well be applied to the solution of our difficulties. It is my contention, as already stated, that our troubles are the result of not sticking to our calling as originally practiced. We have forsaken the mortar and pestle in the rear of the store for the more alluring prospects in the front and we have not reaped the expected rewards. What is the remedy?

The remedy, as I see it, is clearly indicated by the influences, which, taken as a whole, are responsible for the creation of present conditions. They are in part mercenary in nature. Undoubtedly, the greed for gain has played its part; but I believe that there have been other influences which have had a greater if not so apparent an effect. The greatest of these influences in my opinion was the lack on the part of the pharmacist of an adequate education to enable him to meet without fear of the consequences the changes made in the last twenty-three years in the legal restrictions thrown about the practice of pharmacy and of a sufficiently comprehensive knowledge of the various sciences to enable him to keep pace with the modern developments in therapeutics.

Only a few years ago, students were graduated from our colleges of pharmacy with what really amounted to but two years of technical education and, if we go back fifteen or twenty years, most of the candidates for licensure had no college education at all. Naturally, in 1906, when the Pure Food and Drugs Act became a law of the land, many of the then practicing pharmacists did not have sufficient confidence in their knowledge of chemistry and the other sciences to permit them to cope with its requirements and then and there ceased to manufacture the galenicals which came within the purview of the act. This statement is not a mere fabrication on my part, but is based on the statements of many of the older pharmacists and on statistics showing the growth in the business of pharmaceutical manufacturing houses immediately following the enactment of this law. The condition became more pronounced as the various states enacted similar legislation. In 1914, when the Harrison Antinarcotic Law went into effect, many pharmacists ceased to make all preparations containing narcotics. Another blow was struck

to manufacturing in the drug store, when the National Prohibition Act was passed in 1919. As a result of this last act, many pharmacists no longer make such simple preparations as tincture of iodine and soap liniment.

Most of the older pharmacists had only a rudimentary education in chemistry and little if any knowledge of pharmacology, bacteriology, serology and immunology. It is no wonder that they found themselves unable to keep abreast of the times in the development and production of synthetic organic chemicals, serums and vaccines and the many other items which comprise our modern *materia medica*. The sad part of it is that their inability to do this very thing has caused the physician and the public to look elsewhere for information on these materials and the pharmacist has been lowered in their regard. It is to this condition, more than any other, that I attribute the growing gap separating the pharmacist and the physician.

To arrest the progress of these sinister influences, which threaten to terminate our very existence, those who are now in active service must return to the practice of pharmacy. We must reëstablish ourselves in the eyes of the physician and the public as real practitioners of a professional calling and thereby silence those who say that we are becoming nothing but merchants. In all probability, many of the older pharmacists, and I do not speak disparagingly of them because they have given the best they had in them to keep our banners flying, will not be able to conform completely to this new order of things but they can at least keep their places of business looking like real pharmacies—put back the show bottles in the windows, get out some of the old shelf bottles and give the prescription counter a prominent place in the store. It is upon the service which these accouterments represent that pharmacy was originally built and it is upon this service that it must depend for its survival. Those who are attending our schools of pharmacy at present, especially those who complete four full years of work will receive an education that should enable them to furnish that expert knowledge which the physician requires and to render the highest type of pharmaceutical service to the public. It is to these young men and women that we must look for the complete restoration of pharmacy to its proper position among the medical services and its future development. I am fully confident that the outcome will be to our liking.

BETTER TREATMENT FOR PHARMACISTS IN JAPANESE GOVERNMENT EMPLOYMENT.

Japanese pharmacists in government employment have occupied a very low station and their treatment was vastly inferior to that accorded to physicians. However, due to the efforts of druggists' associations and various other organizations, their positions in the employment of the Monopoly Bureau of the Finance Department was raised to the regular civil service last August and the ordinance concerning the change was promulgated accordingly. This is regarded as the first encouraging sign for the position of pharmacists, and similar improvements in their employment in prisons were provided by the Diet at the time of adopting the budget and the ordinance which will shortly be promulgated. Similar plans are being contemplated by the officials of the Department of Railways, which employs a large number of pharmacists—there are 34 pharmacists in employment in the five hospitals attached to the Department of Railways. Also there are 108 pharmacists employed by 104 medical stations of the same Department.—Abstracted from *The Japanese Druggist*.

THE SENSELESSNESS OF THE PRESENT APPRENTICESHIP SYSTEM IN PHARMACY AND A POSSIBLE SOLUTION OF THE PROBLEM.*

BY RUFUS A. LYMAN.[1]

More than ten years ago, the year was 1917, I wrote into my Presidential address before the American Conference of Pharmaceutical Faculties, the following paragraph:

"I cannot close without offering a protest against the apprenticeship system. The tendency in these later years is to increase the length of apprenticeship. The excuse is to make better men. The way it works is to crush the spirit out of a man, who has any spirit, and leave in pharmacy a lot of corpses. I maintain that a well-trained college man going into an ordinary store after graduation is in a position to acquire more information regarding the conduct of a business in six months than the average "flunkey" can who hangs around a store in six years. And yet when it comes to taking the Board examination he and the "flunkey" are brought to the same time requirement. If a well-trained college man cannot learn to operate a certain store in four years, he cannot in five. Cannot we wake up like other professions and devise some common-sense scheme that will not act as a crushing mill to both the individual and to professional pharmacy?"

In connection with this statement concerning the apprenticeship system as practiced in pharmacy, I made a certain recommendation. It was known as Recommendation No. 13. Recommendation No. 13 read as follows:

"That the Conference Committee on relations of colleges with Boards be instructed to express the views of the Conference on the matter of apprenticeship, and that this committee, in conjunction with the proper committee of the Boards, be requested to devise or discover a plan which can be developed that will render justice to all, and that progress in the matter be reported as early as possible."

The statement and the recommendation aroused a lively discussion in the Conference and in the pharmaceutical press at the time. Some member of the presidential address committee insisted the statement meant that the President favored the abolition of all drug store experience. Any intelligent man who can read the English language and can think straight cannot possibly find anything in the statement or recommendation that will justify such a conclusion.

However, the committee thinking there must be some unseen and undiscoverable danger in the recommendation offered the following as a substitute: "that a committee of this Conference, in conjunction with the proper committee of the Boards, be requested to devise a plan that will render justice to all concerned in the matter of apprenticeship."

The two recommendations are identical with one exception. The President's recommendation suggested that the joint committees do something and make a report. The recommendation of the Presidential address committee suggested that the joint committees do something, without making a report. This they evidently proceeded to do in true, heroic American pharmaceutical style. Eleven long years have passed and not a suggestion has been made. Things are "at rest."

I am recalling this bit of ancient history mainly for the express purpose of impressing upon the minds of my hearers and my readers that the writer has never been opposed to drug store experience in pharmacy, if that experience is planned

* Section on Education and Legislation, A. PH. A., Portland meeting, 1928.

[1] The University of Nebraska, Lincoln, Nebr.

primarily for the purpose of educating the candidate along practical lines and not for the purpose of giving something for nothing to some "wet-eyed, trembling voiced admirer and defender of the poor boy."

A study of pharmaceutical legislation during the last decade shows that the status of the period of apprenticeship has not been materially altered. It is true that in a few states it has been lessened or abolished. It is also true that more liberal allowances are being made for college training as a part of "practical experience," than ever before.

In the great majority of cases, however, the apprenticeship time requirement is what it was ten years ago. And the only qualification for such apprenticeship is stated in the time-honored phrase—"Where physicians' prescriptions are compounded under the direction of a registered druggist."

Recently surprise has been expressed at the enormous numbers of failures before examining Boards in some of the western states. This is nothing to be surprised at when you consider the term of apprenticeship required in these states is from four to five years. In these days of great opportunity for young men, what must be the mental caliber and physical energy of a man who is content to hang around a store for five years for what knowledge he can pick up in order that he may become a member of an honored craft? Any boy with brains and ambition would have gone into some other line of work and would have been definitely established in business or in some place where he was in line for promotion.

This sort of thing more than anything else is what is giving to pharmacy a very ordinary class of men and throwing to medicine, engineering, agriculture and other lines than pharmacy, our brainier students.

If pharmacy is to have a place under the Sun, she must have her share of intelligent students. If pharmacy is to appeal to intelligent students we must quit doing things on a "dinky" scale. During the last academic year some one of my students had heard of one of the research prizes the AMERICAN PHARMACEUTICAL ASSOCIATION makes so much fuss about. He asked me about it. I informed him it was a prize for pharmaceutical research. Immediately he wanted to know its value. I asked the members of the class what they would guess the amount of the prize to be. Remember these students come in contact with other lines of work such as chemistry, agriculture, economics. The guesses ranged from $500.00 up to $2000.00. The class snorted in disgust when I mentioned the sum. Hereafter I shall try to keep the announcement of pharmaceutical prizes for research from their attention. They will respect their chosen field more.

I can keep from prospective pharmacy students the size of our research and scholarship prizes but it is impossible to hide from them the apprenticeship system. One of Nebraska's most prominent jurists recently said that it was perfectly evident to a layman that in Nebraska those druggists who defend the present apprenticeship system in our state do so because they want cheap help and not because they desire to render a better pharmaceutical service to the commonwealth.

When the layman sees this and the student knows it, it is time for us to see if we cannot work out as a part of our educational program, a scheme in which the student will receive some directed experience comparable to that which students of medicine now receive in the hospitals and students of engineering receive in the shops.

The Commonwealth study brought out the facts with reference to the need of practical experience. I quote from the published report of that study.

"The objectives of that part of the practice of pharmacy, commonly known as store experience as practical experience, are to acquaint the student with the methods of running a pharmacy and to help him gather information which he may use in the class room as an aid to a more thorough mastery of the subject matter of his courses. No exact amount of skill can be specified. The principle to govern the acquiring of store experience should be that the student ought to secure first-hand acquaintance with store practices under guidance and acquire as much skill as can be developed in a period which stops at approximately the point where his performance of practical tasks ceases to be educative and becomes largely routine and mechanical."

The report also indicates in some detail the character of the information the student should obtain and gives the qualification of the owner and the character of the store in which the student is to obtain such experience.

THE EXPERIMENT AT THE COLLEGE OF PHARMACY OF THE UNIVERSITY OF NEBRASKA.

During the academic year just closed the faculty of the College of Pharmacy placed before the Board of Regents a plan to give practical drug store experience to senior students in the College of Pharmacy, which operates only a minimum four-year course. The experience was to be given in the local retail stores in the city. Any store could be used that met the qualifications laid down by the Commonwealth study and whose proprietor would willingly coöperate with the University.

Credit for the course was made comparable in amount to the credit which the Teachers' College of the University gives to its students for practice teaching in the Lincoln schools. Four hours of supervised work in the drug store give one hour of university credit. To obtain three hours' credit a student must give twelve hours per week to the store for a semester of eighteen weeks. A schedule is prepared for each student and he must hold to this schedule just as if it were a class or laboratory period and the student pays the regular university fee for a laboratory course and he receives no monetary compensation from the proprietor of the store. He is there to learn.

When the plan was first suggested to a group of druggists several months before it was initiated it was received with enthusiasm. As the time for putting it into operation drew near, difficulties began to show themselves. First, after the stores had been selected, there was the problem of assigning the students to the stores. Students have their preferences. So have proprietors. Yet it was obvious that if progress was to be made, when a student was assigned to a store he must stay there whether he liked the proprietor or the store or whether the proprietor liked him. He could no more change because he did not like the proprietor than he could change instructors in the university if he did not like the instructor. Neither did it seem possible to make a change if the proprietor did not like the student any more than it would be possible for an instructor in the university to put a student out of the class room if he did not happen to like him.

Great care had to be used, therefore, in the first assignment of students. This was accomplished largely by Mr. William Brookley who is an officer of the State Association. Mr. Brookley so placed the students that no unpleasantness developed during the year, between proprietor or apprentice. This I consider a remarkable piece of work.

The supervision of the work for the university was carried on by Professor J. B. Burt, head of the Depeartment of Pharmacy.

When the assignments were being made I was interested in finding that every proprietor intended placing these men in the prescription department. The prescription department was the very place where the University did not want the men placed. At least not for the purpose of compounding. They had been trained in the laboratories so they were qualified to compound better than to do any other one thing. What the University expects of these men is to learn how to run a drug store. They were to learn everything possible about operation, from the prescription department to the pop-corn machine. Then the proprietors requested that I furnish them with a guide so they would know just what to teach. I suggested that each proprietor should go at it just as if he wanted to train his apprentice to run his own store while he was absent upon his vacation.

I thought I had at last clarified the situation when to my amazement one of the most outstanding and constructive druggists in the state came and said, "Doctor you will just have to make a list of the things you want these boys to know." At last I realized the busy retail druggist is not a teacher and I think they realized it too. So the following outline was made, the suggestions being drawn very largely from the Commonwealth study:

Suggestions for the Study of Practical Pharmacy by Students of the College of Pharmacy, of the University of Nebraska in the drug stores of the City of Lincoln, Nebraska:

- Proprietary preparations
- Specific remedies
- Patent medicines
- Cigar department
- Soda department
  - Operation of frigidaire
  - Ordering of supplies
  - Preparation of syrups, etc.
  - Preservation of syrups
  - Formulas for special dishes
- Sundries
- Perfumes and cosmetics
- Soaps
- Rubber goods
- Stationery
- Magazines and newspapers
- Bandages, gauzes, cotton, etc.
- Surgical supplies
- Ordering—How to buy—Contact with wholesalers
- How to keep and care for stock. How to clean, etc. Want book.
- Keeping the store clean
- System of arrangement and display of stock
- Sale of non-beverage alcohol
- Keeping records of narcotics
- Sale of poisons
- System of prescription filling
- System of handling prescriptions. Triplicate numbered checks, etc.
- Pricing prescriptions
- Wrapping packages
- System of delivery
- Credit accounts
- Monthly statements
- System of bookkeeping
- Discounts
- Inventories
- Checking and pricing goods
- Correspondence
- Banking
- Store policy on returned goods
- Store policy on cashing checks
- Store courtesies, phone, stamps, etc.
- Store policy in building good will and confidence
- Selling
  - How to approach customers
  - Sales talks. Selling by suggestion. Special sales
- Advertising
  - Newspaper copy
  - Hand bills
  - Window signs
  - Show card writing
  - Circular letters
  - Window dressing and displays
  - Counter displays

This outline is not complete and it may be greatly improved but it served its purpose in furnishing a skeleton to go by and produced some uniformity in the instruction. It will be enlarged upon as time goes on and as the work develops. The proprietor follows the outline as closely as possible and the student is required to pass an examination upon the material covered at the end of the semester.

An amusing incident arises occasionally. One proprietor out in the state wanted to get on the University accredited list so that he might so advertise his store to the public.

I wish to call your attention to the fact that real drug store operation cannot be taught in the so-called model drug store which has become a fad in the pharmaceutical schools just now in order to satisfy the popular demand for business training.

Drug store operation calls for responsibility. Lack of responsibility the college man has to a high degree. Responsibility can be developed only by experience. Responsibility cannot be developed in a model store which is built as a model store. It is still a plaything and there is no way to make it anything else, unless the University should establish a drug store in the city to supply the demands of the community. It would be undesirable to add another drug store to the community.

Judging from our first year's experience I believe it is entirely feasible to work out a scheme for practical experience along the lines indicated in this paper. The University of Nebraska is hopeful that this scheme will give as practical a solution to the apprenticeship problem in Pharmacy as the hospital internship has in medicine. It is our intention to graduate no one without this training.

In closing I wish to say that our experiment has been quite satisfactory to both proprietor and apprentice and I am sure the proprietors who have so finely coöperated with the University have found a great pleasure in rendering this service to the young men going into their profession.

DERIVATIVES OF $C_{15}H_{28}$ FROM ECHINACEA.*

BY E. L. WOODS AND EDWARD KREMERS.

The material for this investigation as well as that employed by Fritz Bischof (see JOUR. A. PH. A., 13 (1924), 898) was kindly supplied by Professor Lloyd in the form of a volatile oil. As shown by Bischof, the volatile oil of Echinacea consists very largely of a tetra-hydro sesquiterpene with two double bonds. Attempts to prepare crystalline derivatives have hitherto failed. With benzoyl hydrogen peroxide an oily compound results that is supposed to contain two oxygen atoms apparently added as oxide oxygens to the two double linkages. When hydrated with sulphuric acid, this in turn is supposed to yield a crystalline erythrol, $C_{15}H_{28}(OH)_4$, hence a saturated compound. The further study of this tetratomic alcohol, it is hoped, will throw light on this interesting hydrocarbon, apparently the first of its kind to be found in nature. It should be stated that the reduction of azulene, $C_{15}H_{18}$, by palladium hydrogen as carried out by Augsburger yielded a hydrocarbon $C_{15}H_{28}$, a reduction since verified by R. E. Kremers.

* Abstract of a paper before Scientific Section, A. PH. A., Portland meeting, 1928.

SYMPOSIUM ON PHYSIOLOGY AND BIOCHEMISTRY.

Taking advantage of the meeting in Boston of the International Physiological Congress, the University of Minnesota, through its medical school and the Mayo Foundation, will conduct a program in physiology and biochemistry between July 15 and August 15, 1929. The following foreign scholars will be present:

Prof. E. Laquer, director of the pharmacotherapeutic laboratory of the University of Amsterdam, Holland, whose researches have been on sex hormones and related problems; Prof. Waldschmidt-Leitz, of the German Technical High School, Prague, Czecho-Slovakia was, until recently, an associate of Professor Willstätter, in Munich, whose field is enzyme chemistry.

ASSOCIATION BUSINESS

AD INTERIM BUSINESS OF THE COUNCIL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, 1928–1929.

Office of the Secretary, 10 West Chase Street, Baltimore, Md.

LETTER NO. 9.

June 20, 1929.

To the Members of the Council:

75. Text of the N. F. V. Motion No. 24 (See Council Letter No. 8, page 627) has been carried.

76. Complimentary Copies of the Pharmaceutical Recipe Book, First Edition. Motions No. 25 and No. 26 (See Council Letter No. 8, page 627) have been carried and complimentary copies of the Pharmaceutical Recipe Book, First Edition, have been sent to each person whose name appears on the list, and to a number of publications for review.

77. Election of Members. Motions Nos. 27 and 28 (See Council Letter No. 8, page 628) have been carried and applicants for membership numbered 158 to 188 inclusive, and applicants for membership numbered H-80 to H-92 inclusive are declared elected.

78. Life Membership. In accordance with Article IV of Chapter IX of the By-Laws, John Paul Schoenthal, St. Louis, Mo., has become a life member through the payment of $25.00.

79. Collective Index of PROCEEDINGS *and* YEAR BOOKS, *1903–1925.* The following communication has been received from Chairman DuMez of the Committee on Publications:

"In the annual report of the Committee on Publications to the Council at the Portland meeting last August (See page 913 of the JOURNAL for September, Council Letter No. 16, page 88) the progress on the Collective Index, 1903–1925, was stated. Since that time, the indexing has been completed and a second letter soliciting orders for the publication has been sent out.

"We now have 330 orders for the Index, about 100 of which have been accompanied by payment in advance, and we have bids on the manufacture and distribution of the book from the two firms which, during the last several years, have submitted the most acceptable bids for the YEAR BOOK.

"Our Committee has approved an arrangement of the text and the use of a smaller type than in the Collective Index, 1852–1902, which will effect considerable savings and will bring the new Index more in keeping with other indices in general use.

"With this type and arrangement the Index will, it is estimated, require 500 to 550 pages. Including the cost of indexing, which has been done, the manufacture and the distribution of the book, the sale of 750 books will cover the entire expense and judging from our experience in soliciting orders in advance, it will be easier to sell the book when it is promptly available. It seems inadvisable to order but 750 of the books as there will certainly be a continued demand as our publications find their way, as they are doing, into a greater number of private, public and institutional libraries. We can arrange to print 1000 copies and bind 500, holding the other 500 for binding as required.

"The Committee on Publications therefore recommends that 1000 copies of the Index be printed and that 500 copies be bound at once, and that the contract be awarded to the Lord Baltimore Press of Baltimore, Md., on the basis of their bid of May 10, 1929."

(*Motion No. 29*) *It is moved by DuMez that 1000 copies of the Collective Index 1903–1925 be printed and that 500 copies be bound at once, and that the contract for the manufacture and distribution of the book be awarded to the Lord Baltimore Press, Baltimore, Md.*

80. Tentative Program for the Seventy-Seventh Annual Meeting. With the approval of Local Secretary Brown and his associates, the Secretary submits the following tentative program which has the approval of the Committee on Standard Program. Secretary Christensen of the N. A. B. P., Secretary Cooper of the A. A. C. P., and Secretary Noh, of the Conference of Pharmaceutical Association Secretaries have approved those parts of the program which relate to these organizations.

TENTATIVE PROGRAM FOR THE 1929 MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIA-

TION AND AFFILIATED ORGANIZATIONS, ALEX JOHNSON HOTEL, RAPID CITY, S. DAKOTA.

MONDAY, AUGUST 26TH.

8:30 A.M. Meeting of the Council, A. PH. A.
9:30 A.M. National Association Boards of Pharmacy.
9:30 A.M. American Association Colleges of Pharmacy—Executive Committee Teachers' Conferences: Chemistry Conference; Practical Pharmacy Conference; Materia Medica, Pharmacognosy and Botany Conferences; Commercial Section.
2:00 P.M. National Association Boards of Pharmacy.
2:00 P.M. American Association Colleges of Pharmacy.
6:00 P.M. American Association Colleges of Pharmacy, Dinner.
8:00 P.M. National Association Boards of Pharmacy.
8:00 P.M. American Association Colleges of Pharmacy.
9:30 P.M. Informal Dance.

TUESDAY, AUGUST 27TH.

7:00 to 12:00 A.M. Tour of Rapid Canyon
2:00 P.M. Joint Session National Association Boards of Pharmacy and American Association of Colleges of Pharmacy.
6:30 P.M. Fraternal Dinners.
7:30 P.M. First Session House of Delegates, A. PH. A.
8:30 P.M. National Association Boards of Pharmacy.
8:30 P.M. American Association of Colleges of Pharmacy.
Alumni and other luncheons can be arranged for Thursday or Friday.

WEDNESDAY, AUGUST 28TH.

9:00 A.M. First General Session, A. PH. A.
1:30 P.M. House of Delegates, A. PH. A.
3:30 P.M. First Session Scientific Section.
First Session Section on Commercial Interests.
First Session Section on Historical Pharmacy.
4:30 P.M. Conference of Pharmaceutical Association Secretaries.
6:30 P.M. AMERICAN PHARMACEUTICAL ASSOCIATION Banquet, followed by dancing.

THURSDAY, AUGUST 29TH.

9:00 A.M. Council, A. PH. A.
9:00 A.M. First Session Section on Education and Legislation.
First Session Section on Practical Pharmacy and Dispensing.
Second Session Section on Historical Pharmacy.
12:00 M. Luncheon of Veteran Druggists.
2:00 P.M. General Session, A. PH. A.
4:30 P.M. Conference of Pharmaceutical Association Secretaries.
8:00 P.M. Joint Session Scientific Section and the Section on Practical Pharmacy and Dispensing.
Second Session Section on Commercial Interests.

FRIDAY, AUGUST 30TH.

9:00 A.M. House of Delegates, A. PH. A.
2:30 P.M. Second Session Scientific Section.
Second Session Section on Practical Pharmacy and Dispensing.
Second Session Section on Education and Legislation.
7:00 P.M. Final Session House of Delegates.
9:00 P.M. Final General Session, A. PH. A.
10:00 P.M. Reorganization Meeting of the Council, A. PH. A.

SATURDAY, AUGUST 31ST.

8:00 A.M. Auto excursion to high points in Black Hills.

The principal changes as compared to the program of the last meeting are that an entertainment feature is provided for Tuesday forenoon and that the ASSOCIATION Banquet is transferred to Wednesday evening. Dr. J. H. Beal, Dr. O'Harra, of the School of Mines of South Dakota, and Dr. Charles Mayo, of the Mayo Clinic, will be the principal speakers at the General Sessions.

(*Motion No. 30*) *It is moved by Kelly that the tentative program of the Seventy-Seventh Annual Meeting be approved by the Council.*

81. Applicants for Membership. The following applications properly endorsed and accompanied by the first year's dues have been received.

No. 189, Henry J. Bannon, 55 Palm St., Bridgeport, Conn.; No. 190, Wilbur Lee Barr, 1035 Robeson St., Reading, Pa.; No. 191, Roberto Augusto Benedetti, P. O. Box 176, Panama City, Republic of Panama; No. 192, S. Monroe Bledsoe, Beckley, W. Va.;

No. 193, Charles L. Bordner, 404 S. Madison Ave., Lewistown, Ill.; No. 194, Jacob J. Boyajian, 61 Westland Ave., Boston, Mass.; No. 195, Vernon Hazen Brooks, 25 Maple Place, Port Chester, N. Y.; No. 196, Meda Butler, Redmond, Ore.; No. 197, E. S. Chmara 4189 Campbell Ave., Detroit, Mich.; No. 198, C. Fred Corpron, 335 First Ave. North, Seattle, Wash.; No. 199, Roger T. Cullen, 334 N. Clark St., Wayne, Mich.; No. 200, Clyde Aloysius Daly, 1628 Ridge Ave., North Braddock, Pa.; No. 201, Nicholas Drugociu, 10558 W. Vernon St., Detroit, Mich.; No. 202, F. H. Falkenberg, 2909 Cleveland St., Dallas, Texas; No. 203, C. M. Fallon, 629 Main St., Rapid City, S. Dak.; No. 204, W. W. Ferrin, 707 W. 13th St., Sioux Falls, S. Dak.; No. 205, Harry M. Filler, 616 Tasker St., Philadelphia, Pa.; No. 206, Mitchell Fodor, 10329 Dix Ave., Detroit, Mich.; No. 207, Ivan S. Glidewell, 17 N. Arlington Ave., Indianapolis, Ind.; No. 208, Lcdo. Jesus Gonzalez, Farmacia Gonzalez, Aibonito, P. R.; No. 209, Earl E. Goodnight, 716 No. Ninth St., Lafayette, Ind.; No. 210 John Gorecki, 4174 N. Campbell Ave., Detroit, Mich.; No. 211, Harry Harutunian, 16 Fairfield St., Watertown, Mass.; No. 212, William A. Helfrich, 110 W. Walnut St., Titusville, Pa.; No. 213, Julius Katz, 237 Spruce St., Chelsea, Mass.; No. 214, Scott Kelly, E. Elm St., Gaston, Ind.; No. 215, Frank D. Kriebs, Secretary of Agriculture, Pierre, S. Dak.; No. 216, C. E. Lawson, 1552 Hazelwood Ave., Los Angeles, Calif.; No. 217, Samuel M. Marcus, 854—7th Ave., New York, N. Y.; No. 218, Walter F. Meads, State House, Des Moines, Iowa; No. 219, Fred W. Moore, 24 N. San Francisco, St., Flagstaff, Ariz.; No. 220, Bhagat Ram, 674 W. 36th St., Los Angeles, Calif.; No. 221, Thorne Fitz Randolph, 802 E. Market St., Indianapolis, Ind.; No. 222, Charles F. Schleussner, 155 East 91st St., New York, N. Y.; No. 223, Joseph Schultz, 990 Alders St., Bronx, N. Y.; No. 224, Edwin Clair Severin, West Main St., Philip, S. Dak.; No. 225, Sister M. Ireneus, 1567 Palmer St., Philadelphia, Pa.; No. 226, L. G. Smith, U. S. Hygienic Laboratory, Washington, D. C.; No. 227, Paul S. Smith, 36 South Main St., Winsted, Conn.; No. 228, Nathan K. Stacks, 198 Princeton St., East Boston, Mass.; No. 229, Harry Robert Staub, 431 Greeves St., Kanes, Pa.; No. 230, V. E. Stolberg, P. O. Box 866, Lead, S. Dak.; No. 231, W. E. Talboy, Gardner Hotel, Fargo, N. Dak.; No. 232, Hamilton Vidrine, McNary, Ariz.; No. 233, Paul Westphal, 209 W. 48th St., New York, N. Y.; No. 234, Edward White, 7824—13th Ave., Brooklyn, N. Y.

(*Motion No. 31*) *Vote on applications for active membership in the* AMERICAN PHARMACEUTICAL ASSOCIATION.

82. Applicant for Membership on Account of Contributions to the Headquarters Building Fund. The following non-member of the A. PH. A. has pledged $25.00 or more to the Headquarters Building Fund and has made a cash payment of $5.00 or more. He is entitled to membership and you are requested to vote on the application which has been properly endorsed.

H-93, Paul Anthony Laneri, 56–58 Macdougal St., New York, N. Y.

(*Motion No. 32*) *Vote on applications of contributors to the Headquarters Building Fund for membership in the* AMERICAN PHARMACEUTICAL ASSOCIATION.

83. Applications for Life Membership on Account of Contributions to Headquarters Building Fund. Under a provision made by the Board of Directors of the A. PH. A. at a meeting held in Washington, D. C., on December 7, 1923, a contributor to the Headquarters Building Fund who subscribed $1000.00 or more is entitled to life membership. The following application, which has been properly endorsed, is submitted under this provision.

No. L. M. 1, Walter R. Platt, 60 Orange St., Bloomfield, N. J.

(*Motion No. 33*) *Vote on application for Life Membership in the* AMERICAN PHARMACEUTICAL ASSOCIATION.

E. F. KELLY, *Secretary.*

Vice-President A. W. Pauley has visited a number of State Associations during the last few months; among them—Kansas, Arkansas and Missouri. He brought greetings from the AMERICAN PHARMACEUTICAL ASSOCIATION to these bodies and made them acquainted with the activities of the parent organization. The reciprocal kindly feeling and coöperation is a great help in the advancement of pharmacy. Every State Association is deeply interested in the A. PH. A. Headquarters, and a realization of pharmacy as the foundation of the drug business is growing.

EDITORIAL NOTES

Editor: E. G. EBERLE, 10 West Chase St., Baltimore, Md.

Members of the Council, A. PH. A.: S. L. HILTON, *Chairman;* CHARLES H. LAWALL, *Vice-Chairman;* E. F. KELLY, *Secretary;* H. V. ARNY, A. G. DUMEZ, H. A. B. DUNNING, H. C. CHRISTENSEN, J. A. KOCH, J. H. BEAL, W. B. DAY, T. J. BRADLEY. *Ex-Officio Members:* D. F. JONES, *President;* A. W. PAULEY, W. H. ZEIGLER, *Vice-Presidents;* C. W. HOLTON, *Treasurer;* E. G. EBERLE, *Editor of the Journal;* A. G. DUMEZ, *Editor of the Year Book;* AMBROSE HUNSBERGER, *Chairman of the House of Delegates.*

Collaborators: The Members of the Council; E. FULLERTON COOK, *Chairman,* U. S. P. Revision Committee; W. L. SCOVILLE, *Chairman,* N. F. Revision Committee; the Chairmen of the Sections, A. PH. A.; J. C. MUNCH, A. L. I. WINNE, P. H. DIRSTINE, R. B. ROTHROCK, LYMAN F. KEBLER; A. G. DUMEZ, *President,* A. A. C. P.; CHARLES B. JORDAN, *Chairman,* Executive Committee, A. A. C. P.; H. M. LEROU, *President,* N. A. B. P.; HENRY C. CHRISTENSEN, *Secretary,* N. A. B. P.

OMISSIONS IN THIS NUMBER OF THE JOURNAL.

On account of the inclusion of articles elsewhere it has been found necessary to condense or omit items in the several divisions which follow.—EDITOR.

THE SHIP'S MEDICINE CHEST AND FIRST AID AT SEA.

The medical handbook for merchant seamen, first issued in 1881, has been amplified and reprinted, dedicated to the American merchant seamen, "at whose behest the marine hospitals were first established in the year 1798, and whose history as a patient of the Public Health Service is a record of the progress of medicine and sanitation in the United States."

Surgeon-General H. S. Cumming believes that the book will be even more useful than heretofore, because recently ship's officers, as a condition to obtaining their licenses, have been required to know medical first-aid principles. The growing custom of ships at sea to radio for medical advice from marine hospitals and other relief stations of the Public Health Service has also made it necessary to standardize medical equipment. This matter is covered in the handbook, together with valuable advice useful in such emergencies as poisoning, bleeding, suffocation, fractures, dislocations, burns, electric shock, fits, wounds, etc., which not infrequently occur on the 10,000 merchant vessels registered by the Department of Commerce, the great majority of which do not carry medical officers. A copy of "Ship's Medicine Chest and First Aid at Sea" may be obtained by the master of any documented American merchant vessel upon his request to the Public Health Service. The book may also be purchased from the Superintendent of Public Documents, Government Printing Office, Washington, D. C., at 75 cents per copy—U. S. currency or money order is required.

p-HYDROXY ESTERS OF BENZOIC ACID.

Preserving Power, Detection and Pharmacological Action of p-Hydroxy Benzoic Acid Esters. Th. Sabalitschka. *Chem.-Ztg.,* 53 (1929), 443.

The esters of *p*-hydroxybenzoic acid are used as preservatives of various substances under the names "Nipagi, Nipasol, Nipacombin and Solbrol" very extensively at the present time. Experiments showed that their harmless action increases from the methyl to the propyl ester and in regard to preserving power and effectiveness in man the methyl ester is 8 times, the ethyl ester 17 times and the propyl ester 35 times more active than benzoic acid. The use of esters of *p*-hydroxybenzoic acid for preservation of a great number of substances, also as food-preservants, seems to be more advantageous than that of other known antispetics.—T. H.—*Squibb Abstract Bulletin,* June 26, 1929.

STAINLESS STEEL PROPERTIES.

Studies in Stainless Steel. I. Y. Kawakami. *J. Army Research Staff, Iron and Steel,* 14 (1928), 838.

The author classified 48 kinds of steel into 8 types, according to their chemical composition. No alloys containing 15% showed any thermal expansion, while those with 5% nickel were found to be paramagnetic with an austenitic structure. With quenched speci-

mens, the hardness was greatest when the carbon content was above 0.3%, the chromium content above 11%, or in samples having less than 11% chromium and less than 4% tungsten. Unlike the austenitic structure steels, hardness of the martensitic steels was effected by tempering. With an annealing temperature of 1000° in the latter case, maximum hardness was obtained due to self-hardening. When heat-treated and untreated specimens were subjected to the action of various acid solutions for 1–15 days it was found that the resistance of the treated steel was always greater; when rolled, the corrosion was found to be greater in the direction of rolling than that perpendicular to it. It was also evident that in the same kind of specimens the resistance decreases with increase in inclusions.—J. P.—*Squibb Abstract Bulletin* (June 26, 1929).

NEW AND NONOFFICIAL REMEDIES.

The following additional articles have been accepted as conforming to the rules of the Council on Pharmacy and Chemistry of the American Medical Association for admission to New and Nonofficial Remedies. A copy of the rules on which the Council bases its action will be sent on application.

W. A. PUCKNER, *Secretary.*

BOTHROPS ANTITOXIN.—An antitoxic serum prepared by immunizing animals against the venom of the tropical American serpents of the genus *Bothrops*.

Actions and Uses.—Evidence has accumulated to show that the venom of certain snakes may be neutralized by the employment of a serum obtained from animals that have been injected with venom from a snake of the same family. Bothrops antitoxin is used to neutralize the venom injected by the bite inflicted by members of the genus *Bothrops*.

Dosage.—The serum is administered intramuscularly or subcutaneously; in cases seen late or in the presence of severe symptoms it may be administered intravenously.

H. K. Mulford Company, Philadelphia.

Antivenin (Bothropic).—Tropical American Anti-Snake-Bite Serum.—An antitoxic serum prepared by injecting horses with venom from serpents of the genus *Bothrops*, especially of the "Fer-de-Lance" (*Bothrops atrox*). It is claimed to have neutralizing effect against the venom of the genus represented. The venom is extracted and promptly desiccated. It is dissolved in saline glycerin solution and injected subcutaneously into horses in fractional, gradually increasing doses until immunity has been established. The horses are bled and, after separation, the plasma is concentrated by a salting out process. Potency is determined by tests on pigeons, the maximum amount of venom neutralized by 1 cc. of the serum being taken as the titer of the product; this quantity must neutralize at least 2 mg. of the venom when tested on pigeons, mice and rabbits.

Marketed in syringes of 10 cc. (a single dose).

EPHEDRINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1928, p. 175).

Ephedrine Hydrochloride-Lilly.—A brand of ephedrine hydrochloride-N. N. R.

Manufactured by Eli Lilly & Company, Indianapolis. No. U. S. patent or trademark.

Pulvules Ephedrine Hydrochloride-Lilly, 1/8 grain.
Pulvules Ephedrine Hydrochloride-Lilly, 1/4 grain.
Solution Ephedrine Hydrochloride-Lilly, 3%: It is preserved with chlorbutanol, 0.5 per cent.

EPHEDRINE HYDROCHLORIDE-SQUIBB (See *Jour. A. M. A.*, Sept. 1, 1928, p. 645).

The following dosage forms have been accepted:

Tablets Ephedrine Hydrochloride-Squibb, 1/8 *grain.*
Tablets Ephedrine Hydrochloride-Squibb, 1/4 *grain.*

MACDOWELL'S WHEAT-NUT-CASEIN DIETETIC FLOUR.—A flour prepared from wheat, edible nuts and casein, to which has been added a leavening mixture composed of potassium bitartrate and sodium bicarbonate and sodium chloride as flavoring. The product has approximately the following composition: protein, 28.67; carbohydrate, 28.68; fat, 18.69; ash, 5.64; fiber and pentosans, 7.59; and water, 8.49.

Actions and Uses.—MacDowell's wheat-nut-casein dietetic flour is proposed for use in the dietetic treatment of diabetes and wherever restriction of carbohydrate in the diet is desired. The nutritive value of 500 Gm. of MacDowell's wheat-nut-casein dietetic flour corresponds approximately to 2190 calories, of which 588 are yielded by protein, 696 by carbohydrate, and 906 by fat.

Manufactured by MacDowell Brothers, Ogdensburg, N. Y. No U. S. patent. U. S. trademark 202,030.

TUBERCULIN-KOCH (See New and Nonofficial Remedies, 1928, p. 368).

H. K. Mulford Company, Philadelphia.

Pirquet Test for Tuberculosis (Bovine Type).—Old tuberculin (bovine type) marketed in capillary tubes, put up in packages, respectively, of one tube (M 228–046), two tubes (M 228–047), and ten tubes (M 228–048); a corresponding number of tubes containing concentrated glycerin bouillon for use as a control is included in each package.

Tuberculin Ointment (Moro Ointment) (Bovine Type).—An ointment (M 341–049) containing 50 per cent of tuberculin "Old" (bovine type) with an equal part of hydrous wool fat.

Tuberculin Intracutaneous (Bovine Type).—Marketed in single packages (M 332–050) of one intradermal syringe containing tuberculin old "O. T." (bovine type), 0.2 mg. in physiological solution of sodium chloride, 0.05 cc.; in packages (M 332–051) of five intradermal syringes each containing tuberculin old, "O. T." (bovine type), 0.2 mg. in physiological solution of sodium chloride; and in single vial packages (M 332–028) containing old tuberculin "O. T." (bovine

type), 0.012 Gm. in physiological solution of sodium chloride, 3 cc. (sufficient for 50 tests).

From *Jour. A. M. A.* for January 19, 1929.

CONCENTRATED LIVER EXTRACT-ARMOUR.—A solution of a water-soluble fraction extracted from fresh mammalian liver. One hundred cc. represents fresh liver, 767 Gm. (1 fluidounce represents 8 ounces avoirdupois).

Actions and Uses.—Concentrated liver extract-Armour is used in the treatment of pernicious anemia. Its value in other types of anemia has not been established.

Dosage.—Concentrated liver extract-Armour is administered orally. The average dose is 15 cc. (4 fluidrachms) three times daily, mixed with orange juice or milk.

Manufactured by Armour and Company, Chicago. No U. S. patent or trademark.

Concentrated liver extract-Armour is made by the process developed by Dr. K. K. Koessler and his coworkers, Drs. M. T. Hanke and Siegfried Maurer in the laboratory of the Otho S. A. Sprague Memorial Institute at the University of Chicago. Fresh livers still retaining the animal heat are finely minced and macerated with three volumes of water. The coagulable proteins are removed by heat and the liquid is condensed at low temperature and negative pressure. The resulting extract is treated with hot 85 per cent alcohol under a reflux condenser and the soluble fraction separated by filtration. The clear filtrate is evaporated to dryness in vacuo and the residual extract dissolved in sufficient distilled water containing 20 per cent of alcohol so that 100 cc. represents 767 Gm. of fresh liver.

DEXTROSE (See New and Nonofficial Remedies, 1928, p. 244).

The following dosage forms have been accepted:

Ampules Dextrose, U. S. P., 10 Gm., 20 cc.: Each ampule contains dextrose, U. S. P., 10 Gm., in distilled water, 20 cc.; buffered with sodium glycerophosphate, 0.03 per cent.

Prepared by the Abbott Laboratories, North Chicago.

Ampules Dextrose, U. S. P., 25 Gm., 50 cc.: Each ampule contains dextrose, U. S. P., 25 Gm., in distilled water, 50 cc.; buffered with sodium glycerophosphate, 0.03 per cent.

Prepared by the Abbott Laboratories, North Chicago.

POLLEN ALLERGEN SOLUTIONS-SQUIBB (See New and Nonofficial Remedies 1928, p. 31).

The following products, marketed in 5 cc. vials, have been accepted:

Dandelion Pollen Allergen Solution-Squibb; English Plantain Pollen Allergen Solution-Squibb; Goldenrod Pollen Allergen Solution-Squibb; Perennial Rye Grass Pollen Allergen Solution-Squibb; Ragweed (Dwarf) Pollen Allergen Solution-Squibb; Ragweed (Giant) Pollen Allergen Solution-Squibb; Red Top Pollen Allergen Solution-Squibb; Russian Thistle Pollen Allergen Solution-Squibb; Sunflower Pollen Allergen Solution-Squibb.

The following products are also marketed in 5 cc. vials:

Bermuda Grass Pollen Allergen Solution-Squibb; June Grass Pollen Allergen Solution-Squibb; Mugwort Pollen Allergen Solution-Squibb; Orchard Grass Pollen Allergen Solution-Squibb; Sagebrush Pollen Allergen Solution-Squibb; Western Ragweed Pollen Allergen Solution-Squibb.

Prepared by the method given for pollen allergen solutions-Squibb (New and Nonofficial Remedies, 1928, p. 31).

CINCHOPHEN (See New and Nonofficial Remedies, 1928, p. 123).

The following dosage form has been accepted:

Tablets Cinchophen-Abbott, 5 grains.
Prepared by the Abbott Laboratories, North Chicago.

SULPHARSPHENAMINE-SQUIBB (See New and Nonofficial Remedies, 1928, p. 84).

The following dosage form has been accepted:

Sulpharsphenamine-Squibb, 0.9 Gm. Ampules.

From *Jour. A. M. A.* for January 26, 1929.

PERSONAL AND NEWS ITEMS.

W. Bruce Philip recently traveled eastward to receive the award of the Master of Pharmacy degree from the Philadelphia College of Pharmacy and Science, and spoke at a number of pharmaceutical meetings on his way to the Pacific Coast, and attended the meetings of the Illinois Pharmaceutical Association and Wisconsin Pharmaceutical Association and shared the hospitalities of the Kansas City retail druggists.

May 29, 1829, Sir Humphrey Davy died in Geneva. As a youth he was apprenticed to John Bingham Borlase, an apothecary of Penzance. Sir William Tilden, in an appreciation of Davy's life, speaks of the precocious genius which lifted the apprentice to a position among the greatest scientific discoverers.

Charles Jeleff Carr, of Baltimore, participated in the Prize Essay Contest of the American Chemical Society and received the state prize for writing one of the best essays on chemistry in health and disease. He again entered the contest and succeeded in winning the state prize (in each case $20). Mr. Carr's essay was brought before the National Committee and his work was considered suitable for the winning of the National Garvan Prize. This prize consists of a four-year scholarship to any recognized university in the United States, with $2000.00 cash for maintenance during the four collegiate years.

Although still a youth of 19, Mr. Carr has exhibited a number of interesting characteristics which, if properly developed, are destined to carry him far into his chosen field of endeavor, namely, pharmaceutical chemistry. He has the capacity of paying attention to small details, minor irregularities, and behavior of chemical reactions, and has developed two great characteristics necessary for success in science, patience and accuracy.

During the past two years, Mr. Carr has been employed in the Pharmaceutical Research Laboratory of Sharp and Dohme. He is at present undecided as to whether he will pursue courses leading to the degree of Bachelor of Science in Pharmacy in the School of Pharmacy of the University of Maryland, or whether he will enter courses leading to the degree of Bachelor of Arts in Chemistry in the Johns Hopkins University, and then for his graduate work specialize in chemistry as it is related to pharmacy. With men of this type entering the field of pharmacy, we feel that the future advance of any line of endeavor lies wholly within the perspicacity of its participants.—J. C. K., Jr.

Dr. John Jacob Abel, Professor of Pharmacology at the Johns Hopkins University, has been awarded the gold medal of the Society of Apothecaries of London. This Society is now about three hundred years old. Dr. Abel is widely known for his research on the effects of drugs, his work on the ductless glands and on insulin. Former Vice-President, Charles Dawes, will receive the medal for Dr. Abel.

Dr. Heber W. Youngken has returned from the South where he sought first-hand information as to what is being gathered as Black Haw, *Viburnum prunifolium*, Shonny Haw, etc. He brought back considerable material for research and a large number of southern plants for the herbarium.

The *Journal of the American Medical Association* reports that at the Diamond Jubilee of the city of Rochester, Minnesota, the Olmsted County Business Men's Association on June 11th placed a tablet which was inscribed "as a tribute to Rochester's most illustrious citizens, William James Mayo, Charles Horace Mayo, surgeons, scientists, lovers of their fellowmen." The Mayos were guests of honor also on June 6th at a testimonial dinner, given by the faculty of the clinic and foundation. The faculty voted to establish an annual W. J. and C. H. Mayo lectureship, to be delivered in Rochester by a member of the faculty on a subject related to some contribution which the Mayo family had made to the advancement of medicine. Dr. Charles Mayo will be a speaker at the Rapid City meeting of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Leonard A. Seltzer was awarded the honorary degree of Doctor of Science by the College of the City of Detroit. The following was the citation:

"Leonard A. Seltzer a pharmaceutical scientist of national reputation, graduated from the University of Michigan with the class of 1892. He has been honored twice previously by institutions of higher learning, in recognition of his scientific work in connection with the revision of the 9th and 10th United States Pharmacopœia and the 4th and 5th editions of the National Formulary. He has developed a successful business without losing his interest in scientific research."

Charles O. Lee, of Purdue School of Pharmacy, has been granted a year's leave of absence to complete his work for the doctorate at the University of Wisconsin School of Pharmacy.

Dr. H. M. Burlage, of Corvallis, Ore., will substitute for Professor Lee, during his absence, at Purdue University.

Dr. Harold G. Hewitt, of University of Buffalo, sailed June 7th for Europe. **Edward L. Schwabe, Lewis G. Freeman, Donald Kumro** and **Margaret C. Swisher** have been added to the faculty of the University of Buffalo.

Announcement has been made of the marriage of Miss Anna Elsa Focke, of London, England, to **F. W. Nitardy** of Brooklyn. The ceremony took place at The Parish Church, Hampstead, London, June 1st. Mr. and Mrs. Nitardy have returned and are at home at 2 Grace Court, Brooklyn.

Joseph G. Noh, Executive Secretary of the Pennsylvania Pharmaceutical Association, and Editor of the *Pennsylvania Pharmacist* since 1926, has resigned these positions to become manager of Retail Druggists' Research Department of McKesson & Robbins, Inc. He will be engaged in aiding in the organization of retailers to enforce their rights and to cooperate in providing means of combating unfair trade practices and retail price abuses.

The Pennsylvania Pharmaceutical Association passed commendatory resolutions and tendered a vote of confidence and appreciation to the retiring Secretary-Treasurer, expressive of his valued services.

Dr. Paul S. Pittenger has been named as Chairman of the Board of Control of the American Drug Manufacturers' Association. His associates are Messrs. Murray, Hopkins, Leonhardt, Taylor and Widden.

S. B. Penick, President of the American Drug Manufacturers' Association, sailed on July 2nd to spend two months in Europe. He is accompanied by Mrs. Penick, their daughter and son.

Russell T. Blackwood has been elected to succeed the late Frank R. Rohrman as president of the Philadelphia Wholesale Drug Company.

OBITUARY.

JAMES DIXON NUTT.

James D. Nutt, member of the AMERICAN PHARMACEUTICAL ASSOCIATION, died suddenly at his home in Wilmington, N. C., July 2nd, aged 70 years. Mr. Nutt was born in Wilmington and had resided there during all of his life. He formerly conducted the well-known Nutt drug store and for a number of years prior to his demise was the proprietor of Munds' Pharmacy. We quote from an editorial of the home paper in saying that the deceased never lost an opportunity to champion the cause and the welfare of Wilmington. His life was a noble example of civic pride and intense loyalty. He went his way quietly, devoted to his family, friends and city. He was an inspiration in a great many ways to those with whom he came in contact.

The funeral was largely attended.

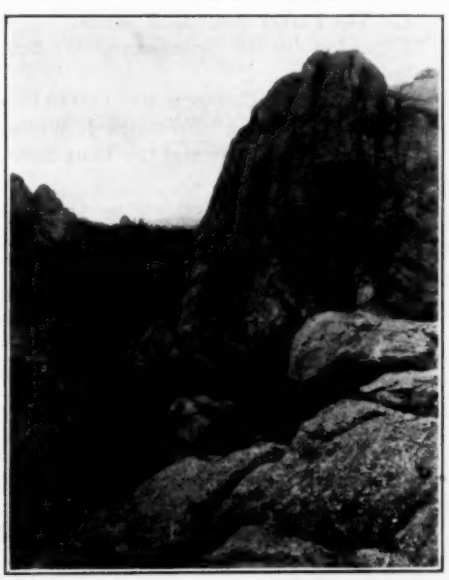
The deceased is survived by his widow and one daughter, Mrs. W. E. Crews. He was a prominent member of the Knights of Pythias and a member of the Episcopal church.

Mr. Nutt was very much interested in the progress of the Headquarters A. PH. A.

SOCIETIES AND COLLEGES.

THE RAPID CITY MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The time for the meetings in Rapid City is fast approaching. The General Program of the ASSOCIATION is given under "Association Business" of this issue of the JOURNAL.



Mount Rushmore, Black Hills. Here the gigantic busts of Washington, Jefferson, Lincoln and Roosevelt are being carved.

The program of the National Association of Boards of Pharmacy is given in the Department of that organization.

The program of the American Association of Colleges of Pharmacy follows in this Department.

The names of the chairmen of the Local Committees follow and also a partial list of the entertainment features.

HOTELS—RAPID CITY.

Alex Johnson Hotel—*Headquarters.*

Rooms with running water $1.75 and $2.00, single.

Rooms with connecting bath and toilet, $2.50 to $4.50, single.

Rooms with private bath and toilet, $3.00 to $5.00, single.

Two-Room Apartments, $9.00, single.

Patton Hotel.

Rooms with running water, $1.00 to $2.50, single.

Rooms with bath, $2.00 to $3.00, single.

Harney Hotel.

Rooms without bath, single, $1.25 per day up. Double, $2.75 per day up.

Rooms with bath, single, $2.50 per day up. Double, $4.50 per day up.

Meals a la carte.

CHAIRMEN OF LOCAL COMMITTEES.

Executive	F. W. Brown
Entertainment	C. L. Doherty
Finance	R. H. Ottman
Hotels	Charles Fallon
Information	Charles Hunt
Publicity (National)	George A. Bender
Publicity (Local)	R. L. Bronson
Reception (General)	C. B. Baldwin

Reception Ladies (Local)..Mrs. R. H. Ottman
Reception Ladies (State)..Mrs. E. R. Serles
Program.....E. R. Serles
Registration.....W. P. Loesch
Transportation.....Arthur Nielsen
Veterans.....L. E. Highley

ENTERTAINMENTS.

Monday, August 26.
American Association Colleges of Pharmacy, Dinner, 6:00 P.M.
Informal Party, 9:30 P.M.
Tuesday, August 27.
Tour of Rapid Canyon for all registered delegates and guests, 7:00 to 12:00 A.M.
Dinner Phi Delta Chi Fraternity, 6:30 P.M.
Musical and Bridge for Ladies, Badger Clark, South Dakota Poet, Masonic Temple, 8:00 P.M.
Other fraternities, alumni and other luncheons can be arranged for on Thursday and Friday, or on Tuesday, at the time of the other fraternity dinner.
Wednesday, August 28.
Visit to Museum of School of Mines for Ladies, 2:30 P.M.
AMERICAN PHARMACEUTICAL ASSOCIATION Banquet (Informal), for all registered delegates and guests, 6:30 P.M.
Thursday, August 29.
Trip to Hot Springs for the Ladies, 12:30 P.M.
Informal Dance, 9:30 P.M.
Friday, August 30.
Bridge Tea, Country Club, for the ladies, 2:00 P.M.
Saturday, August 31.
Auto excursion to high points in Black Hills, for all registered delegates and guests, 8:00 A.M.

PLANT SCIENCE SEMINAR.

August 19–24, 1929, at Game Lodge.

RESEARCH CONFERENCE.

Saturday, August 24, 1929.

First Session at School of Mines, 8:30 A.M.
Second Session at School of Mines, 2:00 P.M.

PROGRAMS OF THE ASSOCIATIONS AND SECTIONS.

Partial programs of the Sections will be found in the June number, page 641; the following are additional titles. Those who desire to contribute papers to the Sections should address the chairman or secretary of the Section, without further delay, for which the contributions are intended. For list of officers see page X.

PARTIAL PROGRAM OF THE SECTION ON EDUCATION AND LEGISLATION.

Chairman's Address, A. L. I. Winne.
Secretary's Report, Glenn L. Jenkins.

1. "Educating the Public on the Profession of Pharmacy," D. B. R. Johnson.
2. "The Transfer of Prohibition Enforcement from the Treasury Department to the Department of Justice," James H. Beal.
3. "What the Pharmacist May Do for Himself," E. C. Brokmeyer.
4. "Student Branches of the A. PH. A.," B. V. Christensen.
5. Subject to be announced, R. L. Swain.
6. "What the Food, Drug and Insecticide Administration Is Doing for Pharmacy," L. E. Warren.
7. "Teacher Training in Pharmacy," E. T. Motley.
8. "The Pharmacy Corps Bill," S. L. Hilton.
9. "The Neighborhood Store—How to Train Men for It," Wortley F. Rudd.
10. "Many Candidates Fail State Board Examinations in District No. 3. Why?" Rudolph H. Raabe.
11. "The Parker Bill," E. F. Kelly.
12. Subject to be announced, W. Bruce Philip.
13. "The Junior College in Relation to Pharmaceutical Education," Frederick J. Wulling.
14. "Bromatotherapy and the Drug Store," Lyman F. Kebler.
15. "Summary of Regulations Governing the Sale of Drugs and Medicines in Sweden," Knut Sjöberg.

GLENN L. JENKINS, *Secretary*,
10 West Chase St., Baltimore.

SCIENTIFIC SECTION.

(Additional Papers—See page 641 in June JOURNAL and page 752 of this issue.)

"The Pharmacology of Ergot with Respect to Biological Assays and Standards," Marvin R. Thompson.

"An Investigation of Oregon Grown Peppermint," Alice H. Hayden and Ernst T. Stuhr.

"Study of Peppermint Oil Grown in the State of Washington," Arthur A. Levine and C. H. Rayburn.

"Umbellularia Californica, Nutt.," Francis A. Nielson and Henry M. Burlage.

"The Seed of Euphorbia Marginata, Pursh.," Lloyd E. Harris and Margaret Gallagher.

"Oregon Drug Plants," Ernst T. Stuhr.

"A Study of the Stability of Solution of Arsenous and Mercuric Iodide U. S. P. X," W. J. Husa and W. W. F. Enz.

"Haziness of Final Chloroformic Extractions in Alkaloidal Assaying," Geo. E. Ewe.

"Methylene Blue, U. S. P., as Precipitant of Irish Moss," Geo. E. Ewe.

"The Effect of Certain Hypoglycemics upon the Seedlings of Lupinus Albus," J. C. Krantz, Jr.

"A Comparison of Methods for Demonstrating Healing of Rickets in the Biological Test for Vitamin D," C. F. Church and J. R. Lockwood.

"The Anthelmintic Qualities of Pepo and Cucurbita Pepo," Neely and Davy.

"Notes on Cascara Sagrada," Harris and Davy.

"Suggestions Relative to U. S. P. X Revision," Jules Bebie.

"The New Remedy Business: Its Uses and Abuses," F. E. Stewart.

"A Thought on the Place of Volatile Oils in Plant Economy," Frederick E. Marsh.

"The Mercuration of Phthaleins in Neutral Solution with Bichloride of Mercury," F. R. Greenbaum.

"The Estimation of Tryptic Activity," F. E. Willson.

"A Critical Study of the U. S. P. Test for Pancreatin," F. E. Willson.

SECTION ON COMMERCIAL INTERESTS.

Several titles for this Section are given on page 641 of the June JOURNAL. Additional papers are asked for; authors should promptly address Joseph G. Noh, 321 State Theatre Building, Harrisburg, Pa., or R. B. Rothrock, Mount Vernon, Ind. The following is submitted:

"Why Not Establish a Regular Fee for the Pharmaceutical Profession?" Edward Swallow.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

The following additional papers have been received by Secretary Newton:

"Clinical Laboratory Work a Prescription Aid," Lee S. Coy.

"Pharmaceutical Practicalities," Robert J. Ruth.

"A National Pharmacy Welfare Fund," Edward Swallow.

"Commercial Aspects of Professional Pharmacy," H. S. Noel.

SECTION ON HISTORICAL PHARMACY.

Secretary George D. Beal reports the following additional papers for the Section on Historical Pharmacy:

"The First Professor of Chemistry and Pharmacy of the South Dakota State College," Lyman F. Kebler.

"Three Pioneers and Their Activities in Initiating Federal Food and Drug Legislation," Lyman F. Kebler.

"George Thorndike Angell, the Fearless Pioneer for Pure Food and Drugs and the Friend of Those Who Could Not Speak for Themselves," Lyman F. Kebler.

"The Birth of the Scientific Journal," Fred B. Kilmer.

"Reminiscences of Early Pharmacy in Baltimore," David M. R. Culbreth.

AUTHORS PLEASE NOTE.

The titles of papers should be in the hands of the Chairman or Secretary of the Section not later than August 1st, for inclusion in the official program. If it is desired to have abstracts of papers mimeographed the copy of the paper with abstract must be in by July 25th. The Secretary of the Scientific Section has agreed to abstract papers for that Section, if the authors so desire.

PROGRAM OF THE THIRTIETH ANNUAL MEETING OF AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

MONDAY, AUGUST 26, 9:30 A.M.

Meeting of Teachers' Conferences.

Chemistry Conference, G. L. Jenkins, *Chairman.*

Materia Medica Conference, L. K. Darbaker, *Chairman.*

Pharmacy Conference, A. B. Nichols, *Chairman.*

Commercial Pharmacy Conference, J. G. Beard, *Chairman.*

MONDAY, AUGUST 26, 2:00 P.M.

First Session of Association.

1. Roll Call.
   Memorial to Prof. Schneider, A. Ziefle.
2. President's Address, A. G. DuMez.
3. Report of Secretary-Treasurer, Zada M. Cooper.
4. Report of Executive Committee, C. B. Jordan.
5. Appointment of Nominating Committee.
6. Paper, "Present Four-Year Courses of Member-Colleges," C. O. Lee.

7. Report of Committee on Higher Educational Standards, L. D. Havenhill.
8. Report of Committee on Curriculum and Teaching Methods, T. R. Leigh.
9. Report of Committee on Activities of Student and Alumni, E. R. Serles.

MONDAY, AUGUST 26, 6:00 P.M.

Annual Dinner.
Address by President Pugsley, South Dakota State College.

MONDAY, AUGUST 26, 8:30 P.M.

Second Session of Association.

10. Report of Committee on Research, A. H. Clark.
11. Report of Committee on Investigation of Pharmacy Schools by Carnegie Foundation, W. F. Rudd.
12. Consideration of Survey of Pharmacy by A. A. C. P., N. A. B. P. and A. PH. A.
13. Paper, "Of What Use Are Mental Educational Tests for College Students?" H. H. Remmers.
14. "To Coöperate in the Revision of the Syllabus," C. W. Johnson.
15. "To Make Necessary Arrangements for Establishing Student Branches of the A. PH. A.," B. V. Christensen.
16. "Pharmaceutical Corps in U. S. Army," A. R. Bliss, Jr.
17. "Relation of Boards with Colleges," Zada M. Cooper.

Meeting of Executive Committee following this session Tuesday, August 27, 10.00 A.M.

Joint Meeting of the N. A. B. P., and A. A. C. P.

TUESDAY, AUGUST 27, 9:00 P.M.

Last Session of Association.

18. Paper, "Four-Year Curriculum," G. C. Schicks.

Report of Representatives and Delegates.

19. "Drug Trade Bureaus," W. F. Rudd.
20. Biological Abstracts, H. W. Youngken.
21. National Conference on Pharmaceutical Research.
22. Druggists' Research Bureau, A. W. Pauley.
23. National Drug Trade Conference, W. F. Rudd.
24. Committee on Simplified Practice, L. F. Bradley.
25. National Association of Retail Druggists, H. C. Biddle.
26. American Council on Education, R. A. Lyman.
27. Unfinished Business.
28. Miscellaneous Business.
29. Election of Officers.
30. New Business.

Executive Session.

JOINT SESSION OF THE NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN ASSOCIATION OF COLLEGES OF PHARMACY.

Report of the Fairchild Scholarship Committee, E. G. Eberle.

"The Fairchild Scholarship—How and to Whom Shall the Award Be Made?" E. G. Eberle.

"Study of Pharmacy and Pharmaceutical Education," L. L. Walton.

SYMPOSIUM ON GENUS MENTHA.

The third annual Symposium on the Genus Mentha will be held at Rapid City, South Dakota, during the meeting of the A. PH. A.

The tentative program as arranged to date consists of the following papers:

"The Stero-chemical Isomers of Menthol," by Edward Kremers, illustrated with models of the eight isomers.

"Synthetic Menthols," by Edward Kremers. Dr. Kremers will present samples of substances from which they are prepared.

"Mints in the Vicinity of Baltimore, Md.," by Charles C. Plitt.

"Mountain Mint," by H. W. Werner.

"Japanese Mint at the Drug Garden, Florida School of Pharmacy," by B. V. Christensen.

"Oregon Grown Japanese Mint," by E. T. Stuhr and E. R. Russell.

Those whose names appear on the list above should send me an abstract of their paper. Those who have papers in the course of preparation, are requested to send titles and abstracts at once.

To those who are debating the matter of a paper—be advised that your chairman wants to get the program and abstracts of all papers in the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION, if it is possible.

Do not put off your reply. We want to make the Symposium a great success this year, and to do this, we need your support.

G. A. RUSSELL, *Chairman*,
Greensboro, N. C.

PRIZE MEMBERSHIPS IN AMERICAN PHARMACEUTICAL ASSOCIATION AWARDED BY PHARMACY SCHOOLS AND COLLEGES.

IOWA COLLEGE OF PHARMACY.

Pharmacognosy, awarded to Jacques Fulton Briceland, by Dean Teeters.

Practical Pharmacy, awarded to Ernest Louis Tigges, by Professor Cooper.

Organic Chemistry, by G. Scherling of Sioux City, to John R. Hennessey.

Professor Kuever's Prize—one year's subscription to JOURNAL A. PH. A.—to Kenneth Paul Moore.

MASSACHUSETTS COLLEGE OF PHARMACY.

Pharmacy, offered by Professor La Pierre and awarded to Julius Katz.

Analytical Chemistry, offered by Dean Bradley and awarded to Nathan K. Stacks.

Materia Medica, offered by President Glover and awarded to Jacob J. Boyajian.

Organic Chemistry, offered by Treasurer Gammon and awarded to Harry Harutunian.

Commercial Pharmacy, offered by Trustee Ellis and awarded to Paul S. Smith.

PITTSBURGH COLLEGE OF PHARMACY.

Pharmacognosy Prize, awarded to Irma P. Seibert.

Materia Medica Prize, awarded to Mrs. Edna B. Stephenson.

Pharmacy Prize, awarded to Milo Evosevic.

Chemistry Prize, awarded to Harold W. Staats.

Inorganic Chemistry Prize, awarded to Leo Schor.

Applied Pharmacy Prize, awarded to Ida E. Chantz.

Physiology Prize, awarded to Thomas T. Spence, Jr.

(*To be continued*)

STATE PHARMACEUTICAL ASSOCIATIONS.

All state pharmaceutical associations are on record for a price maintenance measure, and all associations that have held meetings this year have endorsed the efforts of the AMERICAN PHARMACEUTICAL ASSOCIATION for a Pharmacy Corps in the Medical Department of the U. S. Army. Statements confirming these actions have not been made in the brief reports, therefore, a general reference is made here; such coöperative efforts will eventually bring results. The associations have also given hearty approval and encouragement to the Headquarters project, and their interest is growing. Reports from a number of associations are included in this issue; others must be left to succeeding issues.

ALABAMA PHARMACEUTICAL ASSOCIATION.

Dr. J. D. Humphrey, the oldest druggist of Alabama Pharmaceutical Association was largely instrumental in bringing the convention to Huntsville and had a large part in the program of the meeting. Dr. Humphrey is now in his 80th year.

President Dumas was called away by the death of his sister and First Vice-President W. W. Walker presided. The address of the President was read by former President, Hal E. Duncan.

It was voted to hold the 1930 meeting in Havana, Cuba.

The following officers were elected for the ensuing year:

President, James T. Dumas, Foley.

First Vice-President, W. W. Walker, Birmingham.

Second Vice-President, Z. C. Lewis, Montgomery.

Secretary, W. E. Bingham, Tuscaloosa, re-elected.

Treasurer, Wilbur Ward, Tuscaloosa.

ARKANSAS PHARMACEUTICAL ASSOCIATION.

Hot Springs was selected for the place of meeting for 1930 of the 47th annual meeting of the Arkansas Pharmaceutical Association.

Election of officers resulted as follows:

President, M. D. Daggett, Marianna.

Vice-Presidents, John P. Cox, Hope; and W. B. Ferguson, Paragould.

Treasurer, J. K. Poch, Jr., N. Little Rock.

Secretary, E. D. Oslin, Little Rock.

CALIFORNIA PHARMACEUTICAL ASSOCIATION.

President George H. Frates delivered a splendid address at the annual meeting of the California Pharmaceutical Association encouraging the individual to continue the work of pharmacy. He remarked that which is needed at this time is "a belief in pharmacy."

The speakers of the convention were: Dean H. C. Biddle of the California College of Pharmacy, who discussed "The Trend of Edu-

cation in Pharmacy," and George Eberhardt of San Francisco, who discussed "Business Problems of 1929," and declared that business conditions were good.

"Price Maintenance" was endorsed and the resolution passed urging pharmacists to encourage physicians to make larger use of the U. S. P. and N. F. in their prescribing. Approval was given to the Bill providing for a pharmacy corps in the U. S. Army.

The following officers were elected for the ensuing year:

President, A. H. Vossmeyer, Los Angeles.

First Vice-President, Thomas J. Lenehan, San Francisco.

Second Vice-President, D. D. Wray, San Diego.

Third Vice-President, Henry Gonzales, Oakland.

Treasurer, Harvey A. Henry, Los Angeles.

Secretary, Thomas W. Jones, Los Angeles, reëlected.

COLORADO PHARMACEUTICAL ASSOCIATION.

The Manitou meeting of Colorado Pharmaceutical Association was a record breaker and successful in every way. President David F. Jones of the A. PH. A. attended the convention and presented an interesting outline of the accomplishments of that organization during the 77 years of its existence. Samuel C. Henry of the N. A. R. D. brought a message of cheer relative to progress of the Capper-Kelly Bill predicting its passage within the next two years. Secretary Christensen of the N. A. B. P. spoke on the activities of that organization, stressing the importance and the value of reciprocal registration. Clyde Eddy spoke on the "Changing Trend of Retail Distribution."

The Association endorsed the Capper-Kelly Bill and the establishment of a Pharmacy Corps in the United States Army. F. W. Nitardy and Charles J. Clayton were selected as delegates to the U. S. P. Convention at Washington, D. C., next May.

The officers elected for the ensuing year are:

President, John M. James, Pueblo.

First Vice-President, Monte L. Powell.

Second Vice-President, David B. Frey, Colorado Springs.

Treasurer, Julius F. Earnest, Denver.

Secretary, Charles J. Clayton, Denver, re-elected.

ILLINOIS PHARMACEUTICAL ASSOCIATION.

The Golden Anniversary meeting of Illinois Pharmaceutical Association was held in Rockford, June 25th–27th. The program had a cover of brilliant gold indicative of the first fifty years of development by Illinois pharmacists. Nearly 700 were in attendance at the meeting. During the afternoon and evening of the convention week at Rockford druggists closed their places of business and attended the meetings of the convention in a body. The A. PH. A. was represented by J. Harry Lindahl and the National Association of Retail Druggists by President Denny Brann.

Secretary H. C. Christensen spoke for the N. A. B. P. President Mahaffy reviewed the history of the Association and summarized the accomplishments of the organization for pharmacy in Illinois. He stated that druggists should become affiliated with the AMERICAN PHARMACEUTICAL ASSOCIATION and expressed his appreciation of the work done by the N. A. R. D.

The report of the Secretary and Treasurer showed a total membership of nearly 2100.

Many interesting papers and addresses were presented.

The Antonow Membership Prizes were awarded in the order named: George C. Parks, J. A. Mahaffy, P. F. Coffey and R. W. Sterling.

The following resolutions were adopted:

For the establishment of a Pharmacy Corps and the medicinal department in the U. S. Army; the creation of a Committee to draft a revision of the present pharmacy law. Endorsement was given Superintendent Michels of the Department of Registration and Education. Certain practices of chain store organizations were condemned.

The officers for the ensuing year are:

President, Archer T. Davis, Decatur.

First Vice-President, F. E. Neupert, Danville.

Second Vice-President, George Nrazek, Chicago.

Third Vice-President, George C. Parks, Anna.

Treasurer, George M. Bennett, Urbana.

Secretary, William Day, reëlected, Chicago.

IDAHO PHARMACEUTICAL ASSOCIATION.

Idaho Pharmaceutical Association endorsed the bill for the Pharmacy Corps in the U. S. Army and went on record in favor of a full four-year course in the College of Pharmacy.

President Walker, in his address, referred with appreciation to the effort being made in establishing the A. PH. A. Headquarters. He discussed legislation and conditions of the drug trade in general. Idaho has a pharmacist as a speaker of the House. It is worthy of note that at all of the business sessions almost every person in attendance at the meeting was present, evidencing a deep interest in the affairs of the Association. The officers elected for the ensuing year are:

President, A. A. Walker, Boise.

First Vice-President, J. B. Ostrander, Wallace.

Second Vice-President, Horace Whittlesey, Pocatello.

Secretary-Treasurer, Herschel W. Cummins, Melba, reëlected.

Boise was selected for the 1930 convention city.

MARYLAND PHARMACEUTICAL ASSOCIATION.

The Editor will be pardoned for giving more space to the report on the meeting of the Maryland Pharmaceutical Association than to other organizations, assigning as one of the reasons the fact that one of the foremost governors addressed the meeting and accepted gracefully honorary membership in the Association. The address of Governor Ritchie may be considered one of the outstanding features of the meeting and several quotations are given from his address, to show his intimate knowledge of the value of pharmacy. He deemed it a privilege to further the interests of pharmacists and was glad to have the opportunity to support measures which resulted in placing on the State Health Department a pharmacist member. In his opinion the most important functions of the State are those concerned with the Health Department and the educational system. He was glad that the privilege came to him to support legislation to make the pharmacy law of the State enforcible and was pleased to note that these laws in Maryland were carefully and rigidly enforced. He considered the alignment of the pharmacy law of the state with the Health Department one of the constructive accomplishments during his years as Governor. He was also pleased that the Legislature recognized the general needs of pharmacy and dentistry by making provision for the splendid laboratory building now going up in Baltimore.

Reading of the Governor's address will leave no doubt in the mind of anyone that he has a deep and genuine and profound appreciation of the place which pharmacists occupy in the life of Maryland's citizenship, and that he regards himself as more or less one of the members of the Association, especially in view of the fact that he was unanimously elected an honorary member of that organization.

The Headquarters of the A. PH. A. has from the very beginning held the interest and received the loyal support of Maryland pharmacists, hence, the endorsement received at the recent meeting reaffirmed their interest.

The address by President Howell W. Allen was a masterful interpretation of present-day tendencies in which a complete survey of current progress was made. While he dealt with conditions and affairs of the State, he brought into his discussion the status of pharmacy and drug trade activities in general.

W. E. Braithwaite of the Department of Commerce, Washington, gave a comprehensive and interesting address on "Simplified Practice an Outstanding Example of Selfish Government in Business."

The practical value of statistical surveys carried on by the Druggists' Research Bureau was presented in a most effective manner by Prof. Paul C. Olsen.

Turner F. Currens, of New York City, spoke effectively on the subject "Why Wait for the Customer?"

The Committee reports showed that a vast amount of work had been done during the year by the several committees. The plan of meeting of the Maryland Association is to a certain extent sectional, and this year a Section on Commercial Interests was organized. The Local Committee coöperating with the Executive Committee and the Travelers' Auxiliary is entitled to great credit in making the Ocean City meeting an outstanding success.

An interesting and pleasing event of the meeting was the presentation of a silver service to Dr. R. L. Swain in recognition and appreciation of his constructive work for the Association and its *Journal*. The value of this tribute was enhanced because many had the opportunity of giving expression of appreciation in this delightful way.

The officers elected for the ensuing year are:

President, George W. Colburn, Jr., Princess Anne.

First Vice-President, L. S. Williams, Baltimore.

Second Vice-President, W. B. Spire, Mt. Rainier.

Third Vice-President, L. M. Kantner, Baltimore.

Secretary, E. F. Kelly, Baltimore, reëlected.

Treasurer, G. P. Hetz, Baltimore, reëlected.

Editor, R. L. Swain, Sykesville, reëlected.

MISSOURI PHARMACEUTICAL ASSOCIATION.

The meeting of the Missouri Pharmaceutical Association was held June 18th to 20th at Columbia.

The following officers were elected for the ensuing year:

President, C. W. Hutchason, Kansas City.

Honorary President, Hall Hess, Kansas City.

First Vice-President, H. R. Sprockort, St. Louis.

Second Vice-President, A. L. Rosse, Fayette.

Third Vice-President, C. M. Pfalzgraf, Kansas City.

Secretary, W. H. Lamont, St. Louis, reelected.

Treasurer, William Mittelbach, Booneville.

Historian, Ambrose Mueller, Webster Groves.

NEW JERSEY PHARMACEUTICAL ASSOCIATION.

The 59th annual meeting of the New Jersey Pharmaceutical Association was held at Asbury Park beginning on June 18th, and was rich in accomplishment, being entertaining as well as interesting. About 500 attendants were registered during the convention. Among the recommendations of President Arnold were endorsements of the work of the Druggists' Research Bureau. He also recommended that a special effort be made to assist in increasing the membership of the AMERICAN PHARMACEUTICAL ASSOCIATION.

Reports of the officers showed a healthy and progressive condition of the Association. Appreciation was expressed of the *Journal* and the work of the Secretary and Editor, Dr. R. P. Fischelis.

James F. Finneran, speaking for the N. A. R. D., discussed the problems confronting the retail pharmacists. Secretary E. F. Kelly of the A. PH. A. gave a review of the activities of the organization represented by him. Chairman of the Council, S. L. Hilton, also spoke in behalf of the latter organization. Dean Wortley F. Rudd chose as his subject "Our Problems." His presentation of University connection of schools of pharmacy and advocacy of a lesser number of drug stores was well received. He paid tribute to the support of pharmacists for the advancement of pharmacy.

President Harry E. Bischoff, of the Board of Pharmacy, in presenting the report of that body recommended that the pharmacy law provide for annual registration of drug stores, that the Board have authority to demand samples of drugs, etc., and that adequate facilities be provided for office, storage of records and laboratory facilities.

The following were elected officers for the ensuing year:

President, Dudley G. Singer, Atlantic City.

First Vice-President, Eldridge Prickett, Gloucester City.

Second Vice-President, John G. Graef, Jersey City.

Treasurer, Charles J. McCloskey, Culver Lake.

Secretary, Robert P. Fischelis, Trenton, reelected.

NEW YORK STATE PHARMACEUTICAL ASSOCIATION.

New York State Pharmaceutical Association celebrated its Golden Anniversary at Saratoga Springs. President Herz made a number of recommendations relating to the activities of the Association—That members of the Traveling Salesmen's Auxiliary be appointed on a Convention Committee of Arrangements; appointment of delegates to state pharmaceutical conferences; conduct and activities of committees; amendments to the Pharmacy Law, etc. The Parker Bill was endorsed. The name of the Price Standardization Committee was changed to "Fair Trade Committee." Curt P. Wimmer was awarded the S. S. Dworkin medal for his contribution to the history of the Association; the lecture was illustrated by slides showing pictures of former conventions.

The memorial services honored the lately deceased members: W. H. Rogers, W. L. DuBois, L. J. Schlesinger and A. Braunstein.

The following officers were elected:

President, George F. Bigham, Buffalo.

First Vice-President, Nicholas S. Gesoalde, Brooklyn.

Second Vice-President, Warren L. Bradt, Albany.

Third Vice-President, Harry H. Miller.

Secretary, Edward S. Dawson, Syracuse.

Treasurer, Richard A. Austin, Cairo.

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.

The 52nd annual convention of Pennsylvania Pharmaceutical Association was held at Bedford Springs Hotel; more than 400 were registered.

Many papers of interest were presented and discussed, among them one by Murray Breese on "A New Job for the Druggist," in which he stated "that the tide is turned and we are beginning to swing the circle; the prescription business is coming back." Congressman J. Russell Leech spoke on "The Corner Drug Store in American Life," and acquainted the members with the current problems facing Congress.

President C. Leonard O'Connell delivered a most timely and constructive address. He divided his message into four distinct units; dealing with organization, education, the independent retail pharmacist and legislation.

Secretary Joseph G. Noh gave an interesting and comprehensive account of his work, and at the conclusion of the address tendered his resignation, to accept a position in which there are opportunities for larger efforts. The Association passed resolutions commending the work that the Secretary had done during his years of office, and extended best wishes for success in his endeavor. The $20.00 gold prize of the Association for the best paper presented during the meeting of last year was awarded to E. Fullerton Cook for his paper on "Drug Store Policies."

Dean Julius A. Koch represented the A. PH. A. and extended greetings. The N. A. R. D. was represented by Ambrose Hunsberger.

The officers of the Association for the ensuing year are:

President, C. Leonard O'Connell, Pittsburgh.
First Vice-President, George W. Fehr, Philadelphia.
Second Vice-President, Frank P. Kelly, Carbondale.

The Delegates to the U. S. Pharmacopœial Convention are L. L. Walton, P. Henry Utech and Ambrose Hunsberger.

It was practically decided to hold the next annual meeting of the Association at Buena Vista Springs Hotel, June 17th–19th.

SOUTH DAKOTA PHARMACEUTICAL ASSOCIATION.

Floyd W. Brown, President of the Association and also Local Secretary of the AMERICAN PHARMACEUTICAL ASSOCIATION, presided over the transactions of South Dakota Pharmaceutical Association. His address evidenced a clear conception of the many problems facing pharmacy. Among the recommendations and points of interest in the address the following are named:

He urged closer coöperation with the commercial section; favored election of the President by mail ballot; he commended George A. Bender for his work as *Publicity Chairman* of the A. PH. A.; he urged a study of laws pertaining to public health; and recommended legislation which would require the registration of drug stores with the State Department of Agriculture. He praised the work of the School of Pharmacy in Brookings. He gave hearty endorsement to the Pharmacy Corps Bill and encouraged continued support on the Headquarters Pharmacy Building and recommended a vote of thanks to President Jones and the AMERICAN PHARMACEUTICAL ASSOCIATION for selecting Rapid City for the 1929 convention.

Many interesting and valuable papers were read and discussed.

One of the entertainment features of the convention was the Veterans' dinner. Frank Bockoven is the *President* of the organization; Fred Vilas, the *Vice-President;* Floyd W. Brown, *Treasurer;* and S. H. Scallin, *Secretary*. The members expect to meet with other veterans in Rapid City in August.

The officers of the Association for the ensuing year are:

President, J. J. McKay, Pierre.
Vice-President, H. L. Lewis, Hartford.
Treasurer, Frank S. Bockhoven, Clark.
Secretary, Roland Jones, Gettysburg.

Sioux Falls was selected for the 1930 meeting, to be held June next.

TEXAS PHARMACEUTICAL ASSOCIATION.

The report on the Texas Pharmaceutical Association is lengthier than the report of most of the other Associations, and this may be pardoned because it was the Golden Anniversary meeting and the writer is numbered among the older ex-presidents of that organization. The space given to the transactions both in Fort Worth and Dallas papers evidenced an appreciation of the work of pharmacists and the part they have in the state's activities and in the public health service. The meeting was held in Fort Worth and the number of registrants was larger than ever before in

the history of Texas Pharmaceutical Association; including the families and the Travelers' Auxiliary more than 1600 were registered, and more than 1200 were present at the banquet. Chairman Marvin Anderson and his committee are entitled to great praise for the successful entertainment program.

The *Dallas News* of June 16th devoted a page and a half to a brief but comprehensive history from the very beginning of Texas Pharmaceutical Association.

Secretary Walter D. Adams is entitled to the credit for preparing this historical summary which appeared in more extended form in the official organ of the Texas Pharmaceutical Association, the *Texas Druggist.* It required search, extending over several years to complete the records and it is a valuable contribution to the history of State pharmaceutical associations. A bound copy of this, together, with the proceedings of this year's convention, is to be presented to the A. PH. A. Headquarters. An interesting feature of the convention was carried out under the direction of former President Walter H. Cousins, editor of the *Southern Pharmaceutical Journal.* He introduced the ex-presidents, who spoke briefly, and each presented a sponsor who, presumably, agreed to be present at the centenary of Texas Pharmaceutical Association; a number of the ex-presidents were inclined to think that they would be too busy at that time and therefore delegated the duty to others; there were sixteen in attendance.

A brief address on the first day of the meeting, by E. G. Eberle, was referred to the Committee on Resolutions, who afterwards made a report which was unanimously adopted, to create a Texas fund of $5000.00 or more to equip and maintain, as far as possible, the editorial rooms at the A. PH. A. Headquarters.

The members of the Committee appointed are as follows: J. T. Coulson, Dallas; William Ochse, San Antonio; Mrs. H. M. Settle, Dallas; Fred Mailander, Waco; W. W. Kelton, Dallas; W. H. Cousins, Dallas. The Committee was empowered to add others to its number.

The address of Dr. Joseph E. Gildy, president of Texas State Medical Association, was delivered in a happy style but, throughout, serious thoughts were reflected in his remarks. He stated that he had appointed himself as delegate to the convention because he was the president and had the right to appoint the delegate. He remarked that he is a family physician, that he believed in leaving the tonsils in a while, and also other organs of the body which surgeons perhaps too frequently remove. He believed in medicine for sick people and that the pharmacy was the place to obtain it, and an educated pharmacist should be the one to fill prescriptions. He expressed appreciation of the coöperative work with pharmacists in the state legislature. In his opinion the public was not ignorant of the need for doctors and pharmacists. That when desperately ill and the death angel hovers near a call goes to the family doctor who writes the prescription for reliable medicines to be filled by an educated and trustworthy pharmacist. He objected to the long hours of pharmacists and to the lack of proper recreation. He believed in good publicity for doctors as well as for pharmacists. While some doctors say such publicity seems like hunting for practice, he would rather hunt for something that he could benefit or cure than to promote the distress due to neglect. He had no use for the selfish doctor who could see nothing but "me and my fee." He closed his address with an appeal for higher educational standards and for coöperation of doctors and pharmacists.

The address of welcome to Fort Worth was made by Hon. E. A. Thomas, representative of the Mayor, and on behalf of the druggists of Fort Worth by Dr. W. J. Danforth. The address of President Pittard was comprehensive and full of encouragement. Papers and addresses occupied every spare moment of the most interesting program. Among the contributors were President Denny Brann, of the N. A. R. D.; Clyde Eddy, John W. McPherrin, Frank P. Holland, Jr., of *Holland's Magazine.* Chester A. Duncan's subject was "Why Kill the Goose that Lays the Golden Egg?" in which he stressed the importance of pharmacy. Many more took part in the discussions and presented reports but even mention of them would extend this incomplete summary beyond its allotted limitations. Both the Ladies' Auxiliary and the Traveling Mens' Association held interesting meetings, which were largely attended. The former provide for the pharmaceutical education of several young ladies each year and the Association annually votes a number of scholarships for the same purpose.

The officers elected for the ensuing year are:

President, Henry F. Hein, San Antonio.
First Vice-President, John E. Ray, Abilene.

Second Vice-President, E. B. Oliver, Longview.

Historian, Chester A. Duncan, Dallas reelected.

Home Secretary, J. W. Graham, Austin, reëlected.

Secretary - Treasurer, Walter D. Adams, Forney, reëlected.

The convention was a great success and the changes since the organization are a revelation; there remains among the living only one charter member—Milton H. Hickox, of Dallas, who also is a charter member of the Drug Travelers' Association and it is a pleasure indeed to have journeyed with this gentleman of the old school. The writer is deeply appreciative of the reception given him; he knows the druggists of Texas as friends and esteems their friensdhip.

UTAH PHARMACEUTICAL ASSOCIATION.

Utah Pharmaceutical Association held an interesting meeting. Every member regretted the absence of Secretary John Culley who is now located in California. The convention's sincere greetings and appreciation for his years of unselfish work in the Association's behalf were sent to him. Mrs. Culley was present and served the Association in registering the members and visitors.

The ASSOCIATION endorsed a Pharmacy Corps in the U. S. Army, and also is on record for a Price Maintenance measure.

President Charles O. Watson, in his address, dealt largely with legislative matters and discussed a model pharmacy law.

The officers elected for the ensuing year are:

President, Henry E. Peterson, Cedar City.

First Vice-President, Horace S. Ensign, Ogden.

Second Vice-President, P. B. Van Orden, Lewiston.

Treasurer, Eugene L. Wade, Salt Lake City.

Secretary, George Flashman, Salt Lake City.

Directors, J. S. Forrester, Richmond; John L. Boyden, Coalville; H. H. Peterson, Richfield; Dean Clark, St. George; Frank McCagherty, Salt Lake City.

Ogden was selected for the Convention City of 1930.

WASHINGTON STATE PHARMACEUTICAL ASSOCIATION.

Washington State Pharmaceutical Association went on record, at its convention in Seattle, in favor of two types of courses in schools of pharmacy—one for the needs of the professional pharmacy and the other for the modern commercial pharmacy, with training in subjects that have special value in stores of this kind.

President Weed's address was largely devoted to business conditions and dealt with the many services which the State Association is giving and developing.

Former President C. W. Johnson, of the A. PH. A., extended the greetings of that organization from President Jones and outlined the present activities of the organization.

The bill for the Pharmacy Corps in the U. S. Army was endorsed.

The pleasures of the convention were enhanced by the presence of a number of British Columbia druggists who were in attendance. Editor F. C. Felter of the Pacific Drug Review outlined some of the fundamentals in the preparation of various forms of advertising. A number of other interesting and valuable papers and addresses were presented and discussed.

The officers for the ensuing year are:

President, M. A. Weed, Seattle.

Secretary, Harry W. Ayres, Seattle.

Treasurer, Walter H. Hinman, Seattle.

Board of Managers, C. D. Brachen, Seattle; Stuart Sims, Cashmere; George Finnegan, Bellingham; Mrs. Wilbur N. Joyner, Spokane; R. L. Hunt Everett.

NEBRASKA PHARMACEUTICAL ASSOCIATION.

The 48th annual meeting of Nebraska Pharmaceutical Association was held at Lincoln, June 10th–13th. Among the speakers of the Convention were: Clyde L. Eddy on "Changing Trends of Distribution in the Retail Field;" J. W. McPherrin on "What Will Happen Next and Who Cares?" and President Denny Brann of the N. A. R. D. The following officers were elected:

President, Smith C. Wilson, Lincoln.

Vice-Presidents, M. E. Rasval, Ogallala; E. V. Allen, Indianola; Jerry Hlava, Omaha; W. E. James, Palmer; L. W. Gorton, Omaha.

Treasurer, D. D. Adams, Nehawka.

Secretary, J. G. McBride, Lincoln, reëlected.

Steps were taken for celebrating the 50th anniversary to be held in Lincoln in 1931.

During the convention the Veterans Club was organized. Sixty members were present at the banquet.

Omaha was chosen as the next meeting place.

LEGAL AND LEGISLATIVE.

HEARING ON MILK OF MAGNESIA TRADE MARK.

Hearings in the Trade Mark suit of McKesson & Robbins *versus* the Charles Philipps Chemical Co., were held in the U. S. District Court, South Norwalk, Conn., on June 6th by Judge Edwin S. Thomas. Decisions in the case have not been made public.

FEDERAL TRADE COMMISSION ORDERS.

Johnson & Johnson, of New Brunswick, N. J., manufacturer of medical and surgical supplies, has been ordered by the Federal Trade Commission to discontinue maintenance of resale prices of one of its products—Johnson's Toilet and Baby Powder. The order, as in a number of instances, shows that the desire of manufacturers cannot always be carried out. The aim, of course, of the manufacturers usually is to give the retailer a living profit.

COMMISSIONER DORAN TO REMAIN IN OFFICE.

Secretary Mellon has declared that there are no facts to justify the circulation of rumors that Commissioner Doran is to be relieved of his office. He states that rumors of this character do an injustice to a man who is performing a difficult task with a high degree of ability and devotion, and that Commissioner Doran has his confidence and support.

LABELING FOR DOG REMEDIES.

Drugs or medicines labeled as treatments for such dog ailments as distemper, so-called "running" or barking fits, black tongue, demodectic or folicular mange, or for all types of worms found in dogs shall be considered misbranded within the meaning of the Federal Food and Drugs Act, according to a statement of officials of the Food, Drug and Insecticide Administration of the Department of Agriculture.

LABELING "CHERRY" PREPARATIONS.

Cherry juice sirups and other cherry flavoring preparations which owe their flavor chiefly to cherry pits, oil of bitter almonds or benzaldehyde should not be labeled to indicate that their flavor is due to cherry pulp or cherry juice, according to officials of the Food, Drug and Insecticide Administration of the Department of Agriculture, in a statement issued July 9th.

REVISION OF THE JAPANESE PHARMACOPŒIA.

The Japanese Diet has passed the budgetary appropriation for the 5th revision of the Japanese Pharmacopœia, and the preliminary investigation will be carried out for three years beginning from 1929.

ALLEGED OPIUM SMUGGLING.

Dr. C. C. Wu, Minister of the Chinese Nationalist Government, on July 10th suspended Ying Kao, Vice-Consul at San Francisco, whose wife is said to have smuggled opium into the United States.

Dr. Wu issued the following statement:

"In view of the alleged smuggling of opium into the United States, involving the wife of the Chinese Vice-Consul at San Francisco, the Chinese Minister has suspended Vice-Consul Ying Kao from his duties pending a thorough investigation."

Eleven trunks belonging to the wife of the Vice-Consul were searched at San Francisco and found to contain a large quantity of Macao opium. If the charges are found to be true the offenders should not be permitted to remain in this country.

The prompt action of Dr. Wu is commended.

ADDITIONAL TITLES FOR THE SCIENTIFIC SECTION.

"Coal Tar Food Colors," Seward E. Owen.

"The Pharmacognosy, Chemistry and Pharmacology of the Viburnums. I," H. W. Youngken, F. Amrhein and J. C. Munch.

"The Bioassay of Capsicums and Chillies," J. C. Munch.

"Pharmacognosy and Pharmacology of Various Species of Aconitum," H. H. Crosbie and J. C. Munch.

"Evaluation of Pharmaceutical Glassware," N. Storm and J. C. Munch.

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